

DPM[™] | Central Station

Central Monitoring System

Service Manual

mindray

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NOTES

-
- **This manual describes all features and options. The equipment may not have all of them. Contact Mindray DS service department for any questions.**
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Contact Information

Manufacturer: Mindray DS USA, Inc.
Address: 800 MacArthur Blvd. Mahwah, New Jersey 07430 USA
Tel: 1.800.288.2121 1.201.995.8000
Website: www.mindray.com

FOR YOUR NOTES

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FOR YOUR NOTES

1 Safety

1.1 Safety Information

DANGER

- Indicates an imminent hazard situation that, if not avoided, will result in death or serious injury.
-

WARNING

- Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in death or serious injury.
-

CAUTION

- Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor personal injury or product/property damage.
-

NOTE

- Provides application tips or other useful information to ensure that you get the most from your product.
-

1.1.1 Dangers

There are no dangers that refer to the product in general. Specific “Danger” statements may be given in the respective sections of this operation manual

1.1.2 Warnings

WARNING

- The device is intended for use only by clinical professionals or under their guidance. It must only be used by persons who have received adequate training in its use. Anyone unauthorized or untrained must not perform any operation on it.
 - The CMS is a clinical information device. Except for using such components as the mouse and keyboard to perform normal operations, do not touch or disassemble any other component, especially the power component; otherwise, it may result in personnel injury.
 - Do not connect this system to outlets with the same circuit breakers and fuses that control current to devices such as life-support systems. If this system malfunctions and generates an overcurrent, or when there is an instantaneous current at power ON, the circuit breakers and fuses of the building’s supply circuit may be tripped.
 - Failure on the part of the responsible hospital or institution employing the use of the CMS to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazard.
 - Be sure to keep the packaging materials from children’s reach. Disposal of the packaging materials shall comply with your local requirements.
-

1.1.3 Cautions

CAUTION

- Hospitals without stable power source should use an Uninterruptible Power Supply (UPS) to power the CMS. When there is a power failure, the system should be shut down by following the specified shutdown procedure before the UPS is turned off. If the system has a sudden power failure, system failure may occur and consequently the system will not work correctly next time or even have a serious result.
-

 CAUTION

- The host of the CMS should be maintained every three to six months. Its long time continuous operating may lead to failure of the operating system.
 - Protect the device from damage caused by drop, impact, strong vibration or other mechanical force during servicing.
-

1.1.4 Notes

NOTE

- Refer to the Operator's manual for more information.
-

1.2 Equipment Symbols

	ATTENTION: Consult accompanying documents (this manual).
	CAUTION: To reduce the risk of electric shock, do NOT remove cover. Refer servicing to qualified service personnel.
	Alternating current (AC)
	Power switch
	Keyboard port
	Mouse port
	Serial communication (COM) port

	Display port
	Printer port
	USB port or device
	Network port
	Sound output port
	Sound input port
	Microphone port
	TYPE B APPLIED PART
	Manufacture date
	Serial number
	The following definition of the WEEE label applies to EU member states only. This symbol indicates that this product should not be treated as household waste. By ensuring that this product is disposed of correctly, you will help prevent bringing potential negative consequences to the environment and human health. For more detailed information with regard to returning and recycling this product, please consult the distributor from whom you purchased it. * For system products, this label may be attached to the main unit only.

2 Introduction

2.1 Overview

DPM Central Station is intended for professional physicians or paramedics to conduct centralized monitoring over patients monitored by Mindray individual monitors and/or telemetry systems in hospitals or medical institutions.

The central monitoring system (hereinafter called CMS) comprises powerful system software and high-performance computer. It constructs a monitoring network by connecting monitors and/or telemetry. By collecting, processing, analyzing and outputting the information coming from monitors and/or telemetry, the central monitoring system can achieve centralized monitoring over multiple patients so as to greatly promote the efficiency and quality of the monitoring work.

2.2 CMS Recommended Configuration

CMS Hardware components should be highly reliable and stable. Refer to corresponding Operator's Manual for recommended hardware configuration.

2.3 Intellectual Property Protection

The DPM Central Station uses a USB watchdog for intellectual property protection. You must plug the watchdog into the system's USB interface before starting the system. Otherwise, the system cannot start.

NOTE

- **Before you use the USB watchdog, please install driver first.**
 - **When installing or using the CMS, you must plug in the USB watchdog.**
-

If the watchdog is damaged or lost, you may need to reinstall the system software before using a new one.

NOTE

- **When reinstalling the system software, try not to remove the old database so as to keep the old monitoring data.**
-

FOR YOUR NOTES

3 System Installation

3.1 Pre-installation Preparations

3.1.1 Environmental Requirements

The CMS should be installed in an environment where the system can be easily viewed, operated and maintained.

The environment where the CMS is installed should be reasonably free from noises, vibration, dust, corrosive, flammable and explosive substances.

If the CMS is installed in a cabinet, sufficient space in front and behind should be left for convenient operation, maintenance and repair. Moreover, to maintain good ventilation, the CMS should be at least 2 inches (5cm) away from around the cabinet.

When the CMS is moved from one place to another, condensation may occur as a result of temperature or humidity difference. In this case, never start the system before the condensation disappears.

3.1.2 Power Requirements

Each component of the CMS must be powered by the specified power source.

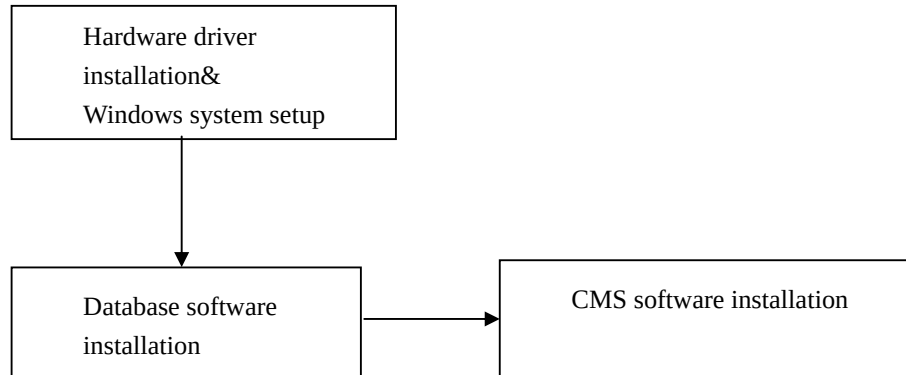
To protect the hospital personnel from electric shock, the CMS (including the host and displays) and its recorder must have their casings properly grounded. The host of the CMS is provided with a 3-wire power cable, which must be plugged into a properly grounded 3-wire receptacle. If a 3-wire, grounded receptacle is not available, consult the hospital electrician.

WARNING

- **Make sure that the operating environment and power source of the CMS meet the specific requirements; otherwise, unexpected consequences, e.g. damage to the equipment, may result.**
 - **Appropriate power supply must be selected according to the setup of the system power voltage; otherwise, serious damage may be caused to the system.**
 - **Never use a 3-wire to 2-wire adapter with any unit of the CMS.**
-

3.2 Installation Procedures

CMS installation procedures include hardware driver installation & Windows system setup, database software MySQL installation, CMS software installation, etc, as shown below.



WARNING

- **The CMS host can not be installed with any other software besides the Windows system, necessary drivers, and drivers/software listed in this manual. Otherwise, normal operation of CMS may be affected and unexpected consequences may result.**
-

NOTE

- **The CMS software only supports Windows® XP® Professional SP2, Windows® XP® Professional Embedded SP2 and Windows® XP® Professional Embedded SP3 operation system.**
 - **Before performing the operations described below, make sure that the main unit is not installed with any application software except the accompanying software of Windows.**
-

3.3 Installation Preparations

3.3.1 CD Preparation

The following software is needed for the installation of CMS software:

Operation System Installation CD patch and drivers

CMS software CD

3.3.2 BIOS Configuration

Set BIOS password to “Hypernet” and start mode to starting from hard disk first.

3.3.3 System Fault Recovery

For errors occurring during installation of application software and setup, quick recovery method can be used to recover the system. For details, refer to ***Chapter 5 System Quick Recovery***. In case of recovery failure, contact the computer supplier. Proceed with the following operations if the system returns normal.

3.4 Hard Disk Partition

The hardware must have three (3) partitions:

Disk C: greater than 10G

Disk D: greater than 60G

Disk E: greater than 10G

The file systems of disks C and D must be in the NTFS format and that of disk E in the FAT32 format.

NOTE

-
- **The file system of the disk partition where the data of the database is located must be in the NTFS format.**
-

3.5 Hardware Driver Installation & Windows System Setup

3.5.1 Double Screen Display Adapter

WARNING

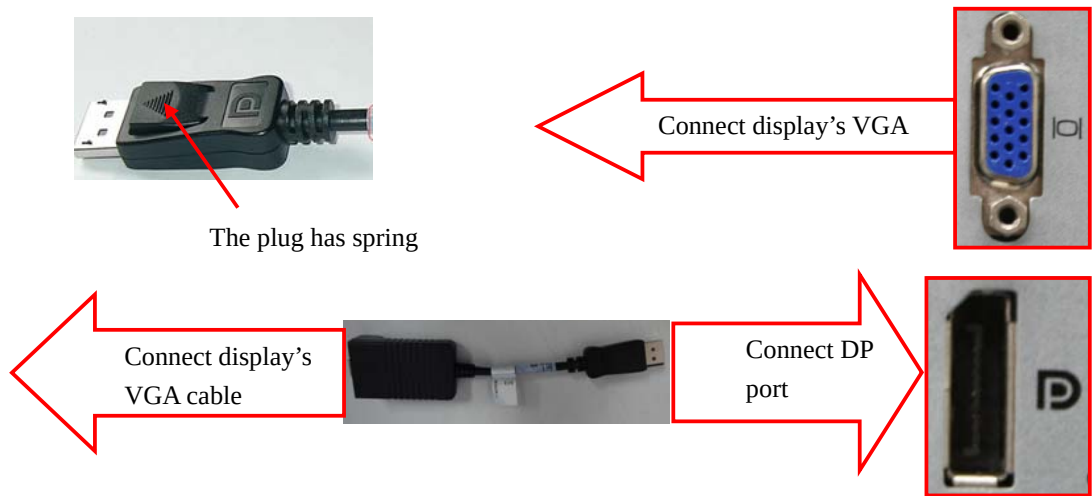
- Disconnect the power cord of the host before installing the PCI double screen display adapter.
-

If it is necessary to install a double screen display adapter, do the following:

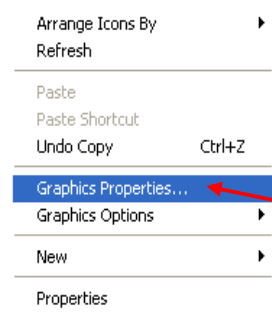
1. Install the double screen display adapter: Disconnect the power supply; insert the double screen display adapter into the PCI slot on the main board and then connect the primary and secondary display respectively to port 1 and port 2 of the double screen display adapter respectively.
2. Install display adapter driver: Refer to the accompanying documents of the display adapter for details. Restart the computer after the display adapter driver has been installed.
3. Set double screen display mode: Refer to the accompanying documents of the display adapter for details.

3.5.2 Implement Double Screen Display by DP-to-VGA Adapter

The double screen display in the CMS can be achieved by DP-to-VGA adapter: Shut down the PC first. Then connect two screens by DP-to-VGA adapter by referring to the below, taking HP8180 host as an example:



When the display is connected, power on the PC and set double screen display according to the following indications:



Right click the mouse and select Graphics Properties from the pop-up menu.

Access the setup tab sheet, and select “Multiple Displays”, then set the operation mode to “Extended Desktop” on the right side. Set the primary display and the secondary display to “Monitor***” and “Digital Display ***” respectively. Specifically, monitor refers to the display directly connecting the VGA interface of the PC, and the digital display refers to the display connecting the VGA by DP-to-VGA adapter.



NOTE

- When unplugging the DP-to-VGA adapter, press the spring button on the DP plug and then unplug it downward. Failure to do so may damage the DP plug.



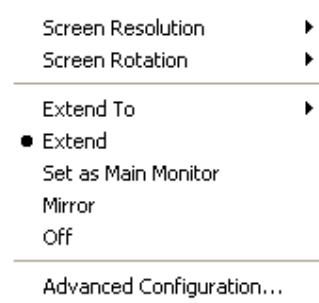
The label beside DP port is:

3.5.3 Installation of Multi-Screen Extend Device (HP T100)

1. Take out the accompanying HP T100 USB cable. Connect one end of the cable with the connector of T 100, and the other end with the CMS.
2. Place the T 100 CD in the CMS drive. Double click the driver in the CD and install by default configuration. The following icon will display in menu bar on the lower right corner of screen when installation is complete.



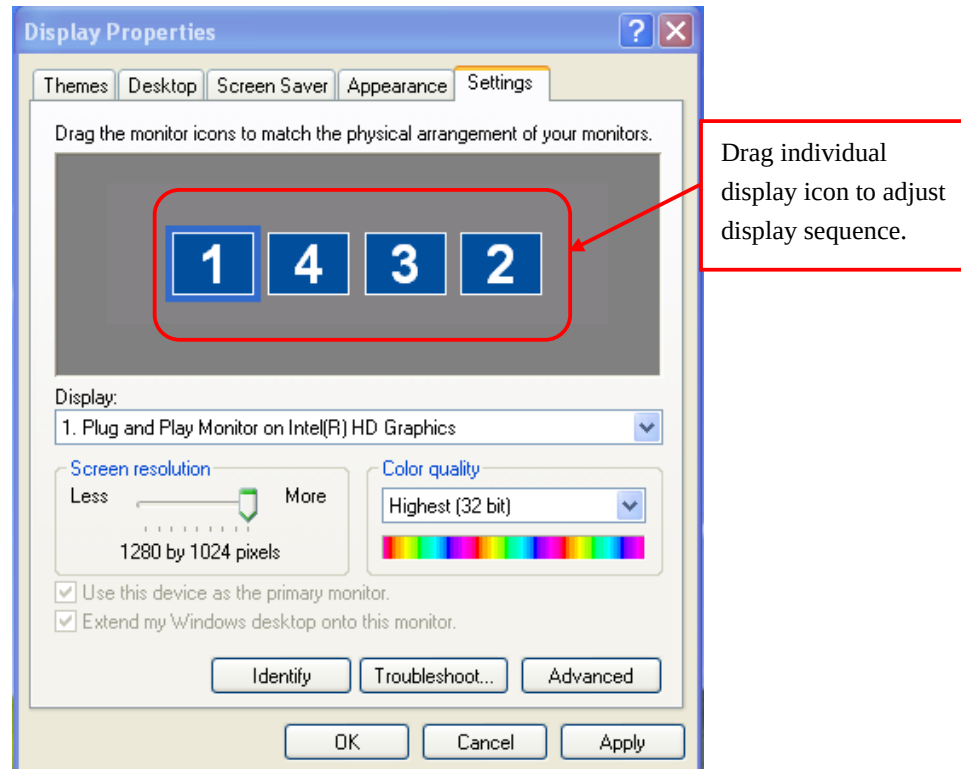
3. Connect the VGA cable of display with T 100. Right click T 100 icon in the menu bar. When the CMS are equipped with three displays, the following menu will pop up. Select the option of Extend, and then the extension of the third screen is done.



When the CMS are equipped with four displays, the following menu will pop up. Select one applicable T100 in this menu, and then select the option of Extend in its sub-menu.



4. To adjust the display sequence, select the option of Advanced from the pop-up menu or sub-menu. The following Display Properties window will show. Set the sequence in the “Settings” tab.



5. Restart PC when the above installation is done. Verify that the display effect meets the requirement.

3.5.4 IP Address Setup and Network Connection

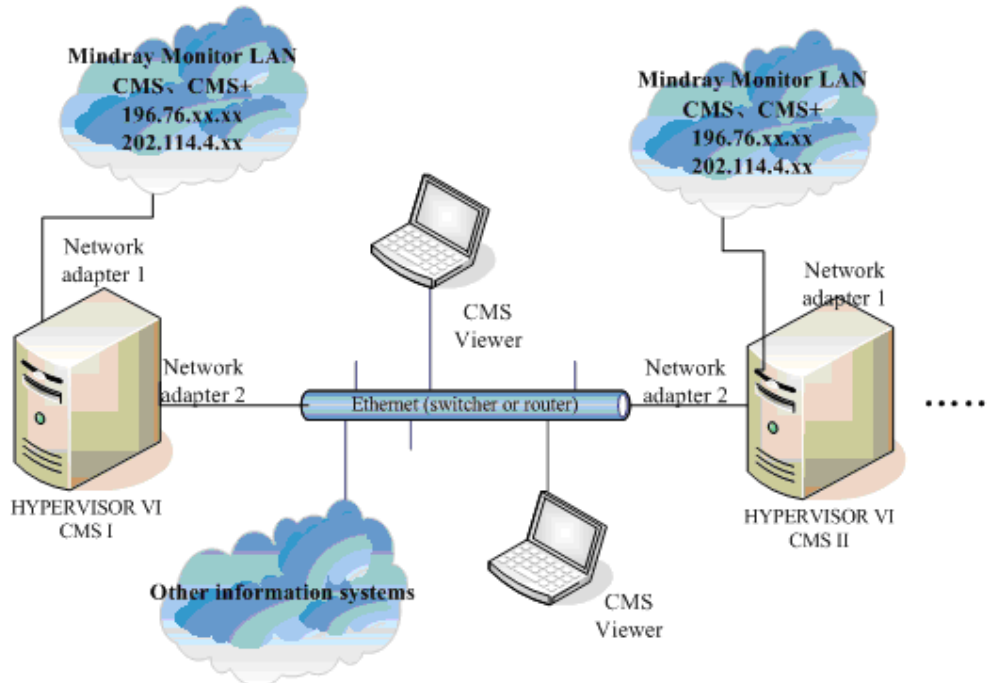
The PC may be equipped with two network adapters to isolate the monitor LAN and the external network to ensure network bandwidth and data safety for the monitors.

NOTE

- If two network adapters are used, be sure to identify which is for monitor network and which is for external network connecting multiple CMSs, CMS viewer or other information systems. Correctly set IP address for each network adapter.
- If two network adapters are used, connect them to corresponding networks as desired.
- Do not connect both network adapters to the same network segment, e.g., do not connect them to the monitor network at same time.

3.5.4.1 Network Connection using Multiple Network adapters

The figure below shows the network connection using multiple network adapters.



As shown in the figure, the two network adapters are respectively connected to the monitor LAN and the external network.

3.5.4.2 Monitor LAN

NOTE

- If two network adapters are used, the one (hereinafter called integrated network adapter) integrated on the PC main board is normally connected to the monitor network and the one (hereinafter called independent network adapter) installed in the PCI slot is connected to the external network.
 - Default, the network adapter integrated on the PC mainboard is configured with two IP addresses, and it can connect the patient monitors using either CMS or CMS+ protocol. The another network adapter in the plugged on PCI is configured with only one IP address, and it can only connect the patient monitors using CMS+ protocol.
 - For the CMS protocol, the IP Address 202.114.4.119 must be configured.
 - The IP address of each monitor should be different. It should also be different with the CMS IP address. Otherwise, network connection will fail.
 - No more than two IP addresses are configured for each network adapter
-

You can configure one or multiple IP addresses to the network adapter connected to the monitor network as desired, see the table below.

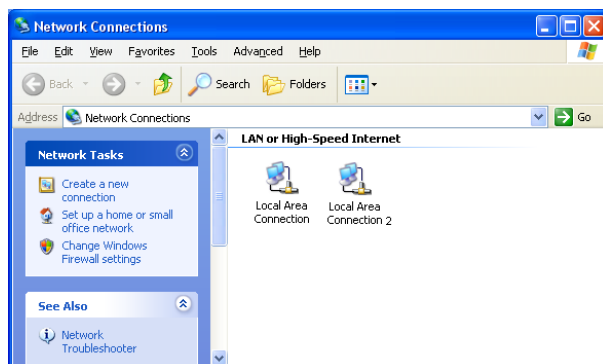
Figure 1 IP Address Settings of Network Adapter Connecting Bedside Monitor LAN

Monitor type	Network protocol	IP address	Subnet mask
PM series	CMS	202.114.4.119	255.255.255.0
PM series & BeneView T series	CMS+	196.76.0.1	255.255.0.0

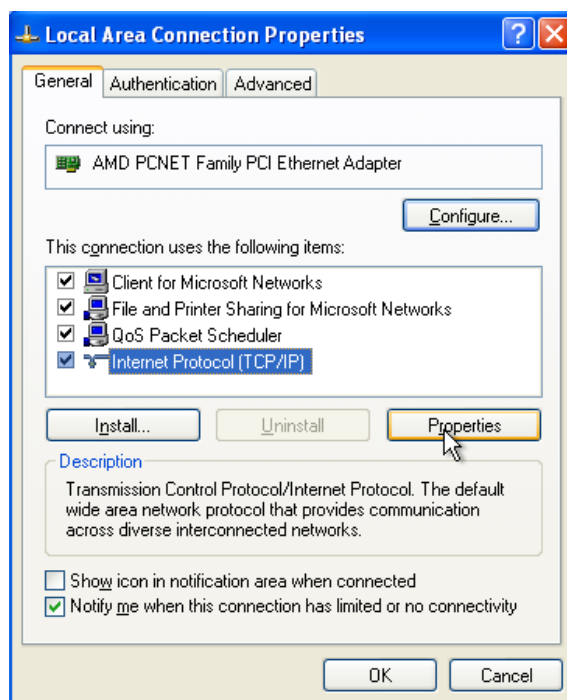
To reduce network bandwidth consumption, IP address should be configured according to the monitor and protocol type on the principle that fewer IP addresses, maximum 2, are configured for each network adapter.

To set multiple IP addresses,

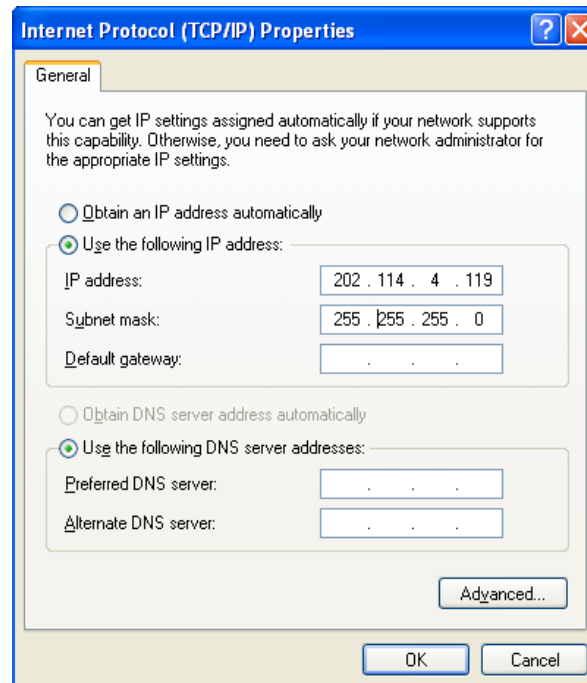
1. Select “Start”→”All Programs” →”Accessories” →”windows Explorer”; select “Network Neighbourhood” and right click the mouse; select “Properties”, you will see the following screen display:



2. Select “Local Area Connection” (pay attention to choose the one actually connected to the monitor network) and then right click the mouse; select “Properties”, you will see the following screen display:

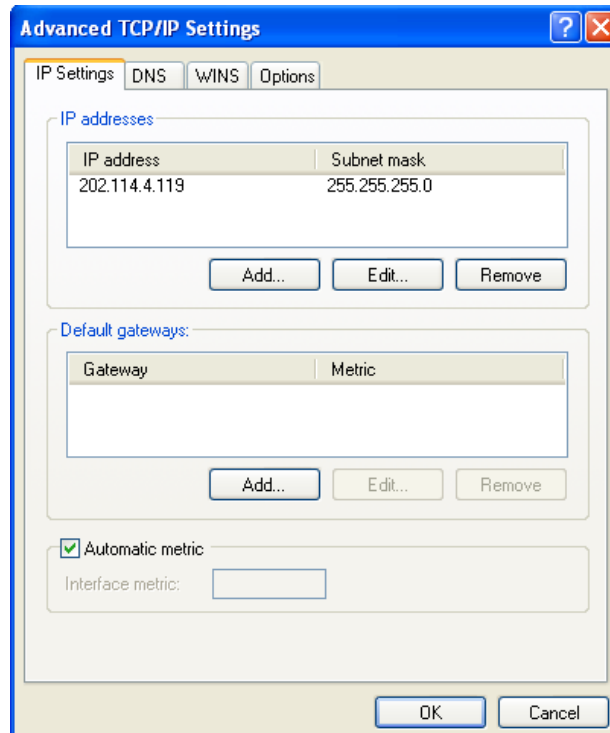


3. Select “Internet Protocol (TCP/IP) ” and click “Properties”, you will see the following screen display:



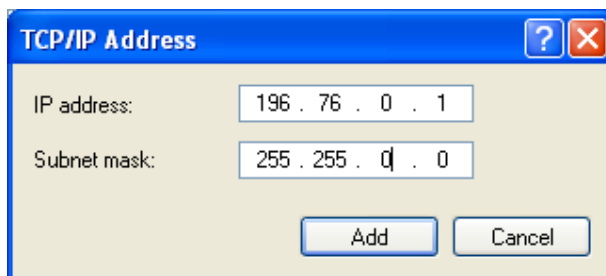
The image shows the "Internet Protocol (TCP/IP) Properties" dialog box. The "General" tab is selected. It contains instructions about automatic IP assignment. Two radio buttons are present: "Obtain an IP address automatically" (unselected) and "Use the following IP address:" (selected). Below the selected option are input fields for "IP address:" (202 . 114 . 4 . 119), "Subnet mask:" (255 . 255 . 255 . 0), and "Default gateway:" (empty). Another set of radio buttons is for DNS: "Obtain DNS server address automatically" (unselected) and "Use the following DNS server addresses:" (selected). Below are fields for "Preferred DNS server:" and "Alternate DNS server:", both empty. An "Advanced..." button is at the bottom right of the main area. "OK" and "Cancel" buttons are at the very bottom.

4. Configure an IP address for the network adapter. If you need to configure more IP addresses, select “Advanced” (see the figure above), you will see the following screen display:



The image shows the "Advanced TCP/IP Settings" dialog box. The "IP Settings" tab is selected. It has sub-tabs for "DNS", "WINS", and "Options". The "IP addresses" section contains a table with two columns: "IP address" and "Subnet mask". The first row contains "202.114.4.119" and "255.255.255.0". Below the table are "Add...", "Edit...", and "Remove" buttons. The "Default gateways:" section contains a table with "Gateway" and "Metric" columns, which is currently empty. Below it are "Add...", "Edit...", and "Remove" buttons. At the bottom, there is a checked checkbox for "Automatic metric" and an "Interface metric:" input field. "OK" and "Cancel" buttons are at the bottom right.

5. Click “Add...” in the “IP Settings”, and then you will see the following screen display:

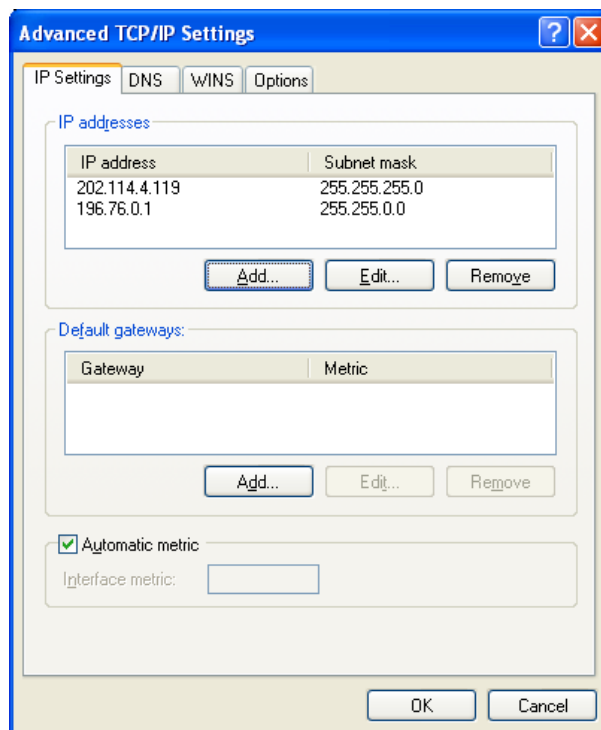


The image shows a Windows dialog box titled "TCP/IP Address". It has a blue title bar with a question mark icon and a close button. The dialog contains two text input fields: "IP address:" with the value "196 . 76 . 0 . 1" and "Subnet mask:" with the value "255 . 255 . 0 . 0". At the bottom right, there are two buttons: "Add" and "Cancel".

NOTE

- The subnet mask code for 196.76.0.1 must be 255.255.0.0.

6. Click “Add” to return to the following screen display. To add more IP addresses, repeat Step 5.



The image shows a Windows dialog box titled "Advanced TCP/IP Settings". It has a blue title bar with a question mark icon and a close button. The dialog has four tabs: "IP Settings" (selected), "DNS", "WINS", and "Options". Under the "IP Settings" tab, there is a section titled "IP addresses" containing a table with two columns: "IP address" and "Subnet mask". The table has two rows of data: "202.114.4.119" with "255.255.255.0" and "196.76.0.1" with "255.255.0.0". Below the table are three buttons: "Add...", "Edit...", and "Remove". Below this is a section titled "Default gateways:" containing a table with two columns: "Gateway" and "Metric". Below this table are three buttons: "Add...", "Edit...", and "Remove". At the bottom, there is a checkbox labeled "Automatic metric" which is checked, and a text input field labeled "Interface metric:". At the bottom right, there are two buttons: "OK" and "Cancel".

7. Click “OK” to finish setting IP address.

3.5.4.3 External Network

The independent network adapter is used to connect the external network. Its IP address should be configured according to actual use.

The external network is required when:

- Other information systems are connected;
- Patients of different CMSs are viewed;
- Local CMS is remotely viewed using a CMS viewer;
- Routers are used.

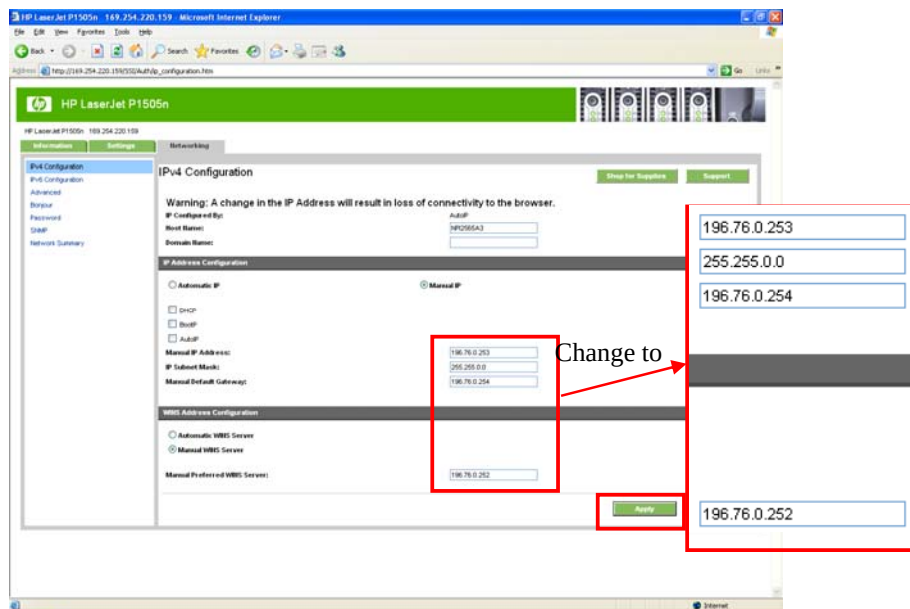
3.5.5 Installation of Printer

Take HP LaserJet P1606dn as an example.
Insert the printer driver CD into the CD-ROM.

Step 1: .Determine the printer IP:

Load the printer with paper and connect with the computer (connect to the network card with IP address 196.76.0.X). Then power on the printer. After the printer finishes self-check, press and hold “Go” button on the printer control panel for 5-10 seconds to print the configuration page which has printer IP address information. Verify this IP address is in the same network segment with the computer. If not, change the printer IP address as per the following method:

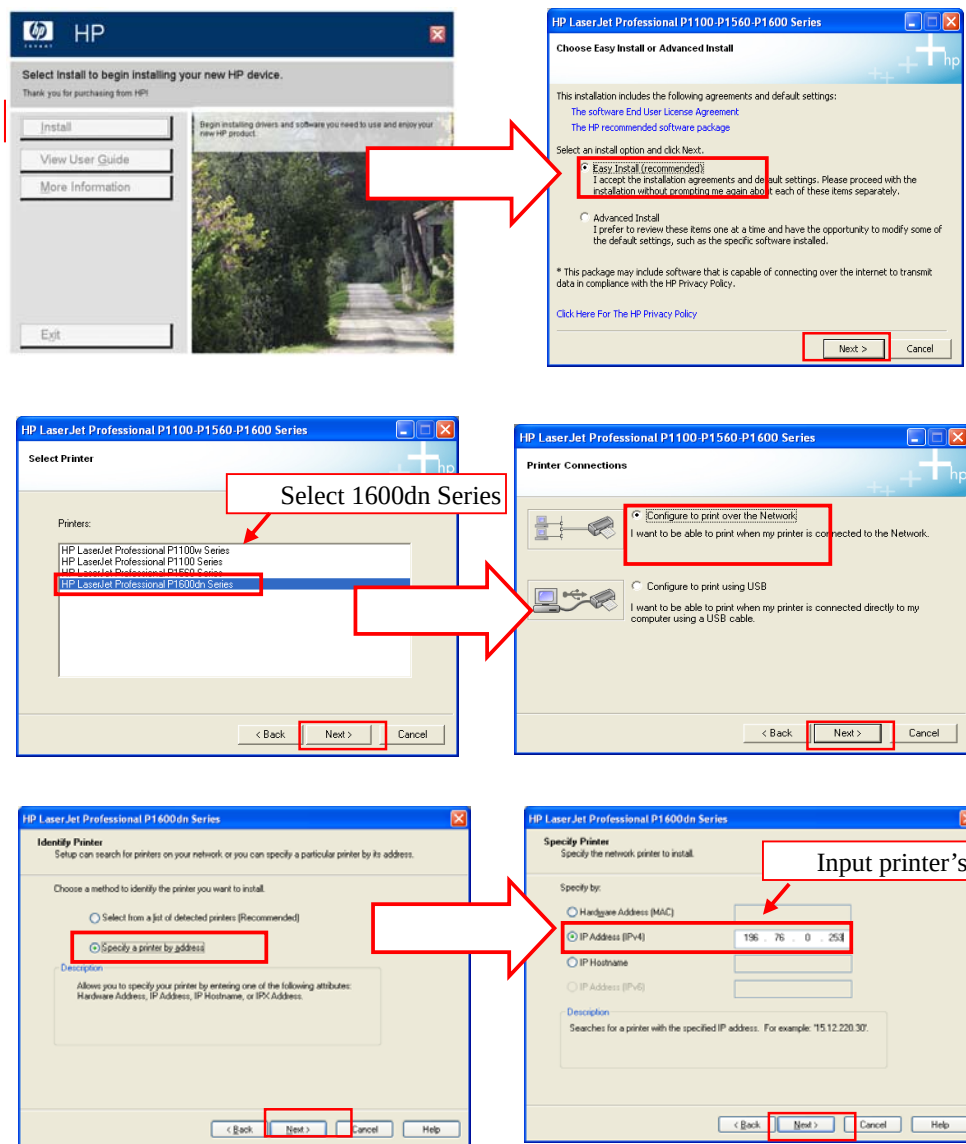
Set the network card IP address so that it is in the same network segment with the printer IP address (refer to the previous section). Use the same subset mask with the one of printer IP address. Run IE and input printer IP address in the address bar to access the configuration tab below.

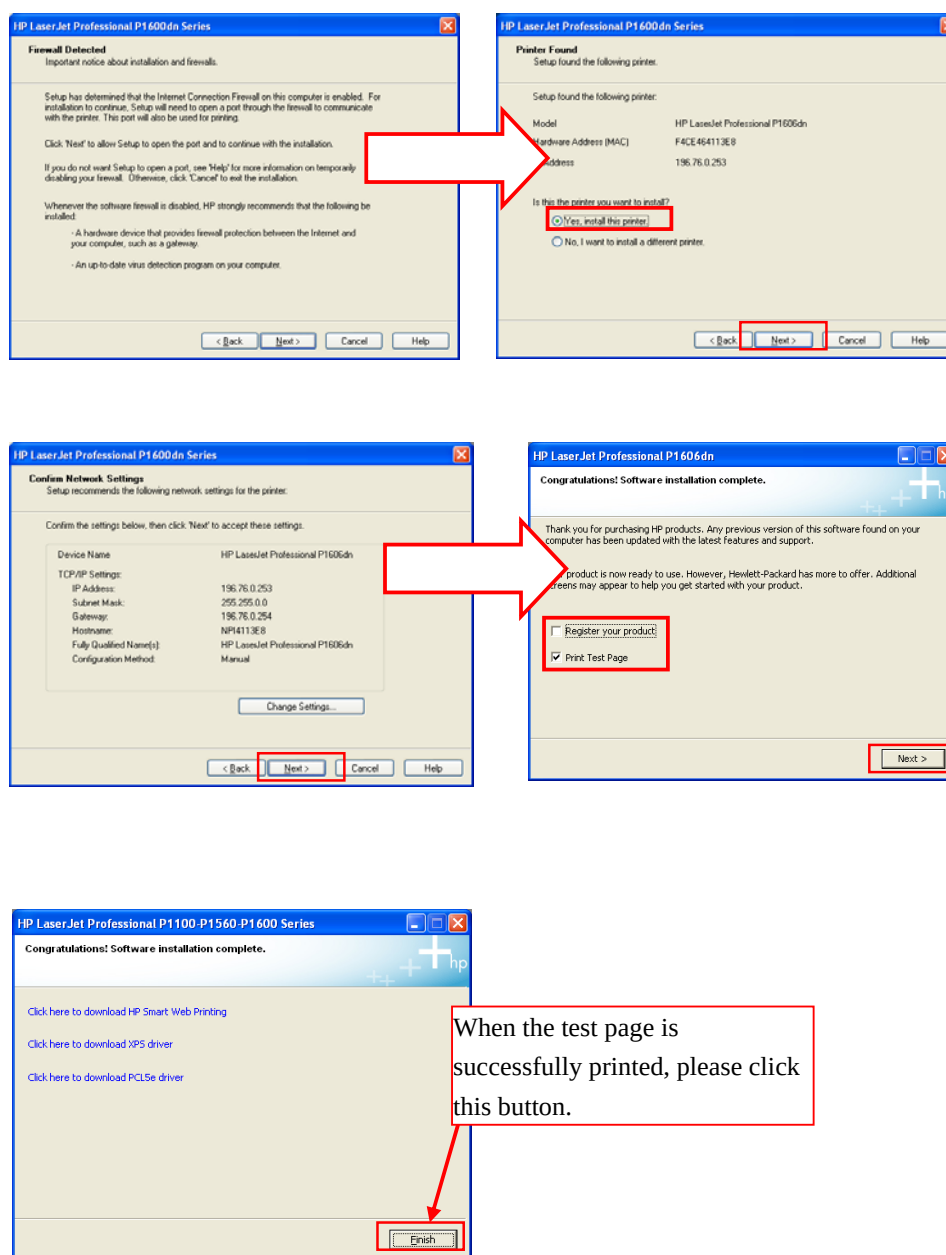


Note that the part marked in red shall be set as the figure shows. After configuring, click “Apply”, click “OK” in the popup and then restart the printer. Then change the computer IP address back to the original one.

Step 2: Install the network printer

Right click the mouse to open CD driver, and then double click “setup.exe” file in the root directory. Install the driver by following the indications shown below in the order of from left to right and from top to bottom:

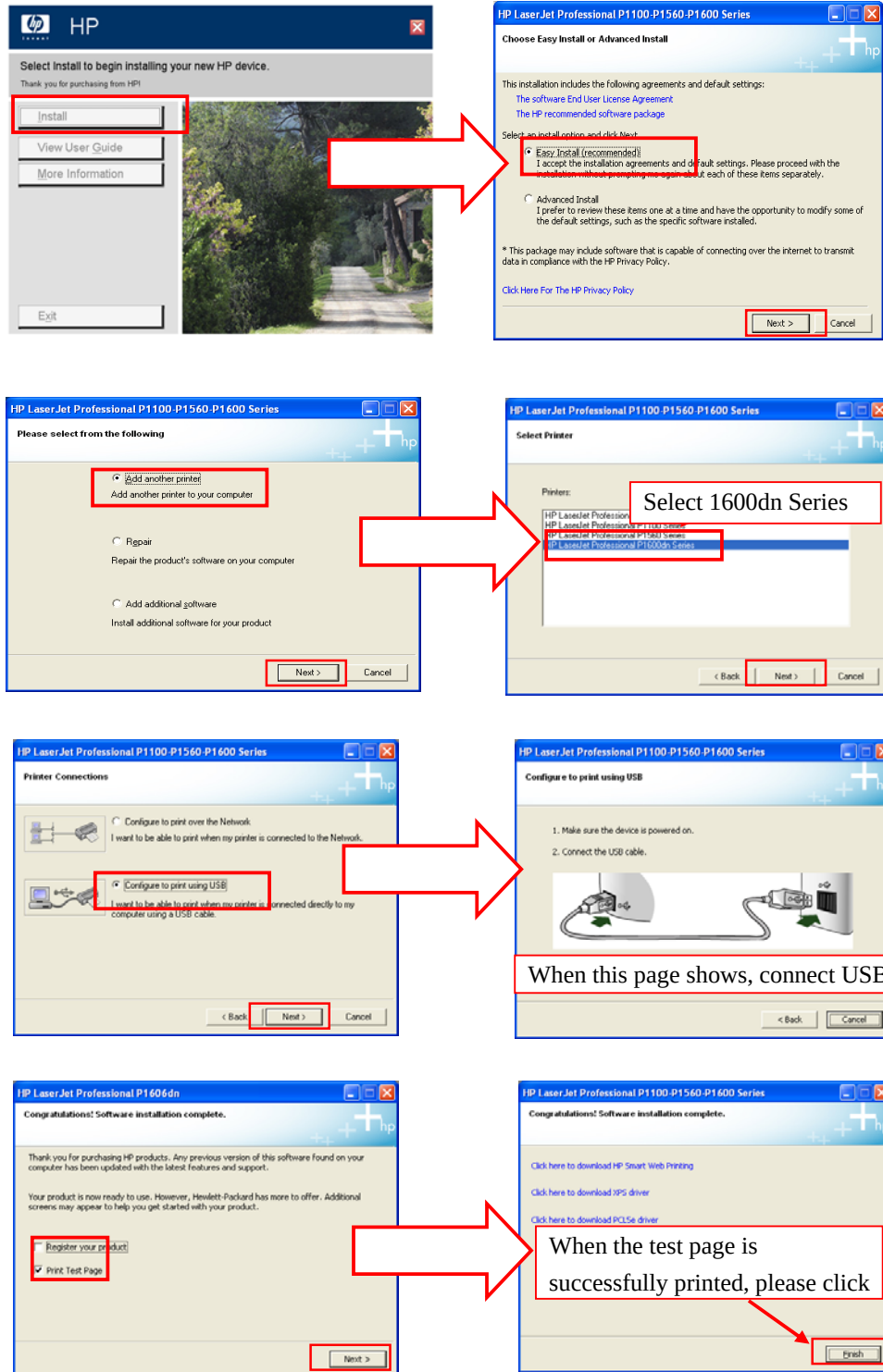




After test page is printed, close all the pop up windows and access “Printers and Faxes”. Select “HP LaserJet Professional P1606n” printer and re-name it as “1606n_net” to complete installation of printer’s network driver.

Step 3: Install the USB printer

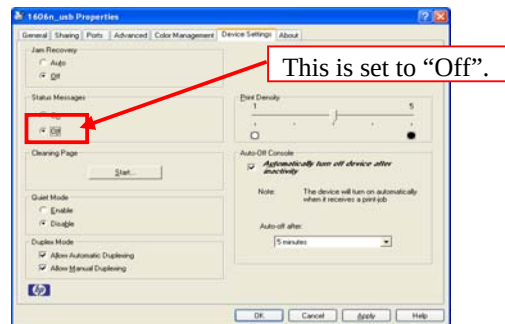
Make sure that USB cable of printer is not connected with PC. Then double click “setup.exe” file under the root directory. Install the driver by following the indications shown below in the order of from left to right and from top to bottom:



After test page is printed, close all the pop up windows and access “Printers and Faxes” again. Select “HP LaserJet Professional P1606n” printer and re-name it as “1606n_net” to complete installation of printer’s USB driver.

Step 4: Set the Printer

After completing network and USB driver installation of 1606n printer, you need to enter the “Printers and Faxes” screen, select the printer and right click the mouse. Then select “Properties”, and enter the “Device Settings” tab sheet in which “Status Messages” should be set to “Off”. You need to set booth network and USB printers, as shown below:



NOTE

- For HP LaserJet 2035n Printer, Double click the ‘Setup.exe’ which is in the driver CD root directory. Follow the installation guide and choose to install network driver or USB driver as needed.
 - When installing a printer, select to install network driver or USB driver based on the actual requirement. Connect the printer to the CMS network if network printing is needed.
-

3.5.6 Installation of Recorder

No recorder driver is needed. Recording can function directly after system software is installed.

3.5.7 Installation of USB Watchdog Driver

1. Insert the CMS software CD and then execute “MicroDogInstdrv.exe” under the “USB Dog Driver” folder to enter the following window.



2. Set as the figure shows and then select “Install” to enter the following window after completing installation.

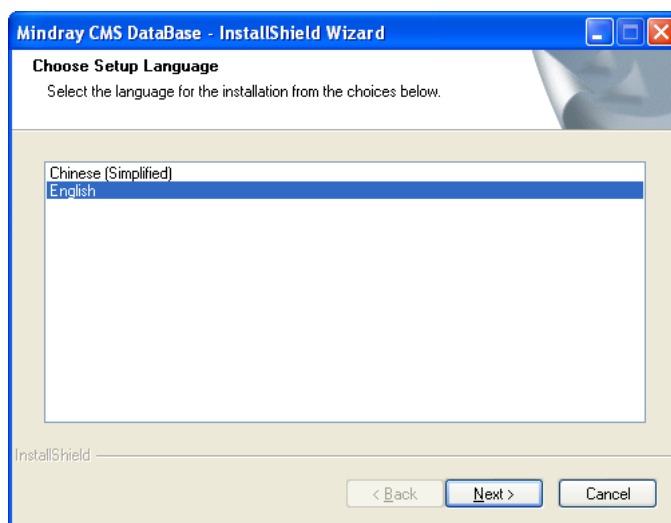


3. Select “Exit” when the prompt message “Driver Installation Completed!” appears.

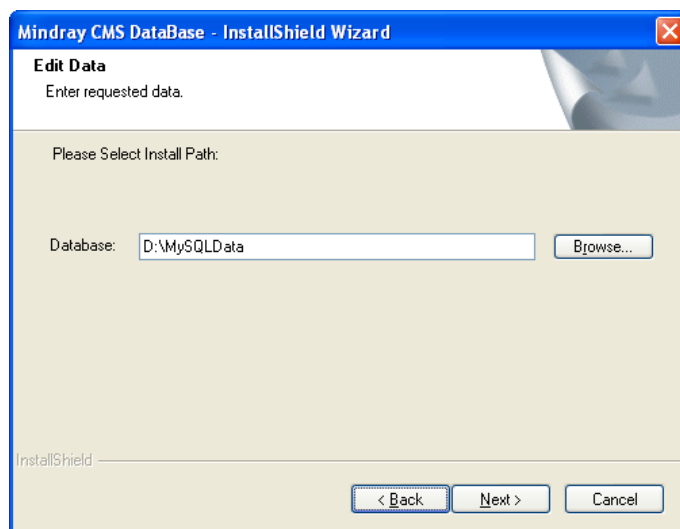
3.6 Installation of Database Software

Insert the CMS software CD, then go to the directory “MySQL Community Server” and install by following the steps. Restart the PC after each step is completed.

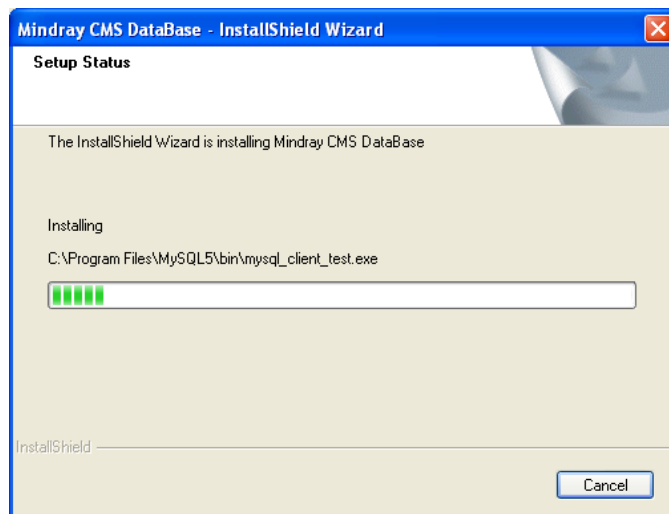
1. Double click MySQLInstall.exe, and the following “Choose Setup Language” screen will be displayed:



2. Select a desired language and click “Next” button till the following screen is shown:

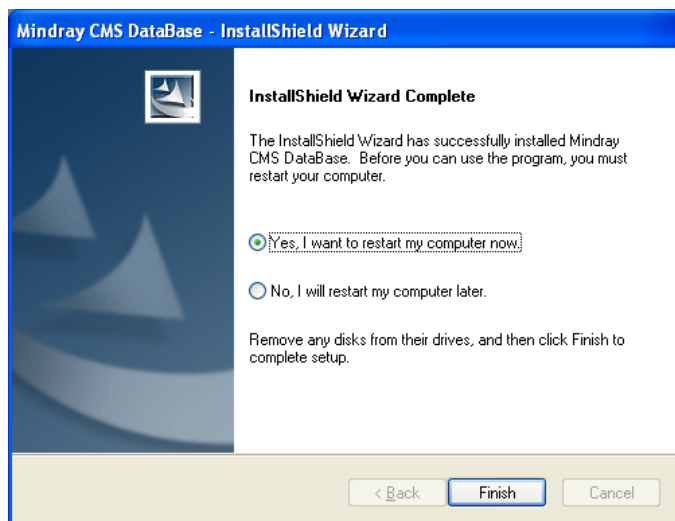


Since the data of database is saved under this directory, make sure that the disk in which the directory is located can read-write and provide enough space. When the selection is completed, click “Next” button until the following screen is shown:



3. Complete installation and restart the PC

When the following screen is shown, it indicates that the database software installation is complete. Select as the following screen shows and then click the “Finish” button. The computer will restart automatically.



3.7 Installation of the System Software

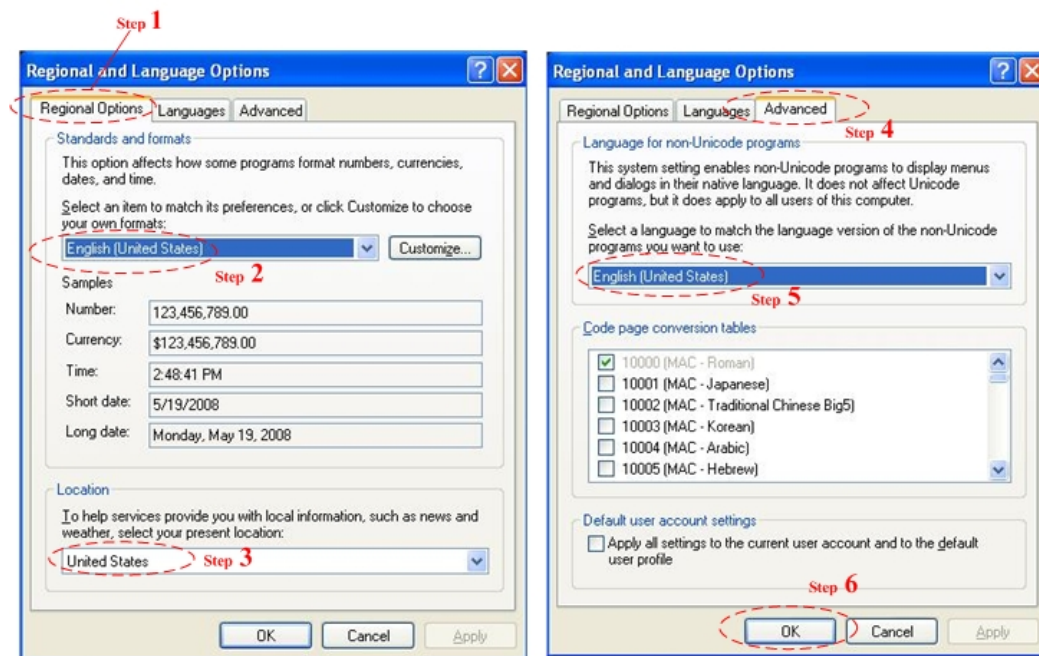
3.7.1 Setting the Region and Language of the Operating System

System

If the language used by the current operating system is just the language the custom wants to display on the CMS, it is unnecessary to set the region and language for the operating system. In this case, just skip this step.

If the language of the operating system is English but the custom wants a non-English for the CMS, it is necessary to set the region and language of the operating system. To set the region and language, follow this procedure:

- Enter the Windows desktop and select “Start” → “Control Panel” to enter the “Control Panel” window.
- Double-click “Date, Time, Language, and Regional Options” to open enter the “Regional and Language Options” dialog box. Then select the “Regional Options” and “Advanced” tabs respectively to select the desired region and language as shown in the figure below:
- Restart the computer after the setting is completed.

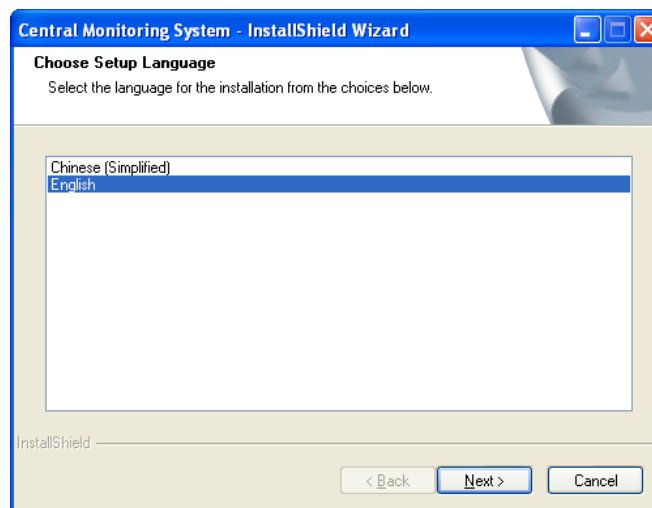


3.7.2 Installation of the CMS System Software

NOTE

- Insert the USB watchdog before installing the system software.
 - The software version of the USB watchdog must match the version of CMS.
 - Connect the network cable. The independent network adapter needs to connect to network.
-

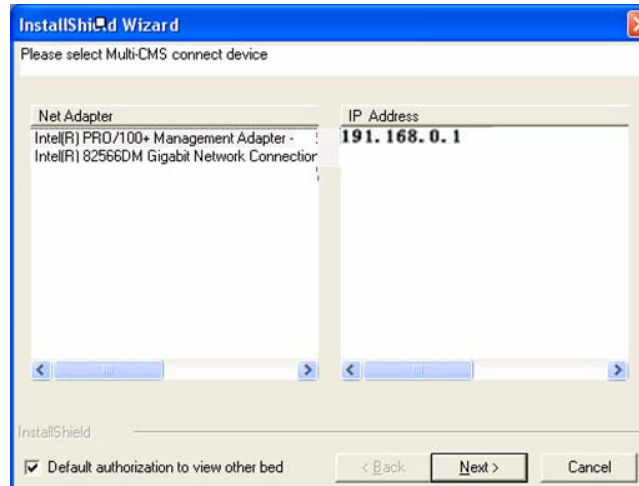
1. In the CMS software CD, double click “SETUP.EXE” under the “Setup” directory to enter the following window.



NOTE

- The language selected as shown in the figure above is the one for display on the screen during the process of installation but not the default one when the CMS is operating. The language used when the CMS is operating is to be set up in the following steps.
 - Set OS language to English before installing CMS system software in English or other language operating system. Change to the desired OS language after the installation.
-

2. Select language as the figure shows. Then click “OK” to enter installation procedure. During the installation, unless required, follow the default installation path, clicking “Next” until the following dialog box pops up.



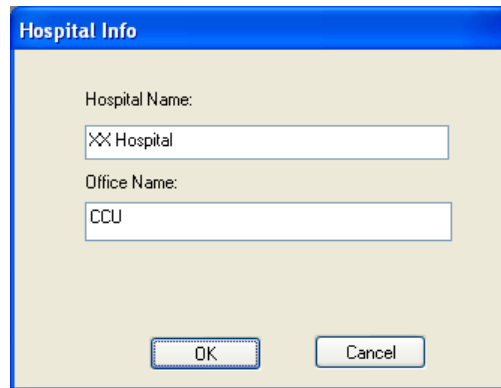
3. Select a network adapter from “Net Adapter” (Usually the independent adapter is preferred.) and then select its IP address (196.168.0.1) from “IP Address”. Click “Next” until the following box pops up. (The displayed parameter will be automatically adjusted in the process.)

NOTE

- The setup screen of network IP address shown above can be displayed only when the watchdog has the function of HL7.
- The setup screen of network IP address shown above can be displayed only when the network card with the IP address 196.76.0.1 connects to network.

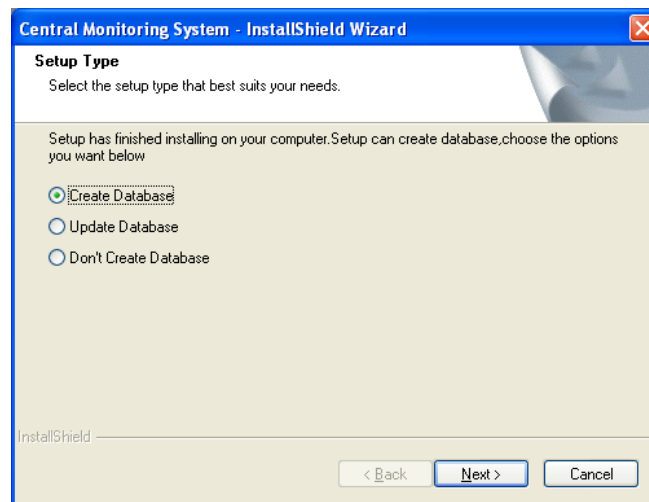


4. Select the desired language from the pop-up box and then click “OK” to enter the following window.



A dialog box titled "Hospital Info" with a blue header bar. It contains two text input fields. The first field is labeled "Hospital Name:" and contains the text "XX Hospital". The second field is labeled "Office Name:" and contains the text "CCU". At the bottom of the dialog are two buttons: "OK" and "Cancel".

5. Fill in hospital name and department name as required. Then click “OK” to enter the following window.



A wizard window titled "Central Monitoring System - InstallShield Wizard" with a blue header bar and a red close button. The window is divided into two main sections. The top section is titled "Setup Type" and contains the text "Select the setup type that best suits your needs." The bottom section contains the text "Setup has finished installing on your computer. Setup can create database, choose the options you want below". Below this text are three radio button options: "Create Database" (which is selected), "Update Database", and "Don't Create Database". At the bottom of the window are three buttons: "< Back", "Next >", and "Cancel". The "InstallShield" logo is visible in the bottom left corner.

Select the desired installation type as per the following NOTE:

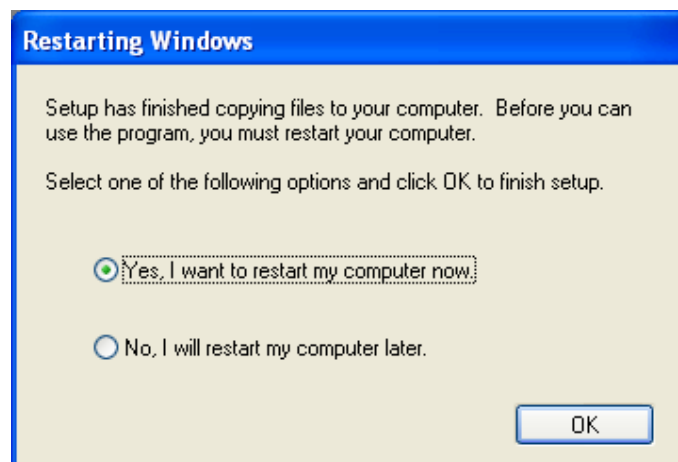
NOTE

- Selecting “Create Database” will destroy the data in the database. “Create Database” is not required in the case of recovering to install CMS software to save the previous data. “Create Database” is required when the CMS software is installed for the first time.
- Selecting “Update Database” will upgrade the data in the database. It is applicable to system software updating from old version to the latest version. Refer to 4.5 Step 5: *Upgrading the Database* for details. Upgrading the database will back up the data in the current database automatically. If the database is already the latest version, the following box is displayed when “Update Database” is selected and “Next” is clicked.



- Select "Don't Create Database" if CMS system software rather than database software is reinstalled and the current database file is compatible with the reinstalled system software.
-

6. Till now, you can restart the system (as shown below). After restarted, the CMS operates automatically. Then, set the size of the CMS screen and then initial database backup can be performed.



3.7.3 Setting the Size of CMS Screen

Access the CMS system. Select “System Setup”→ “Admin Setup”→ “Screen Size”.

Adjust the screen size of the CMS system in accordance with actual screen size.

Restart PC to enable the screen size settings.

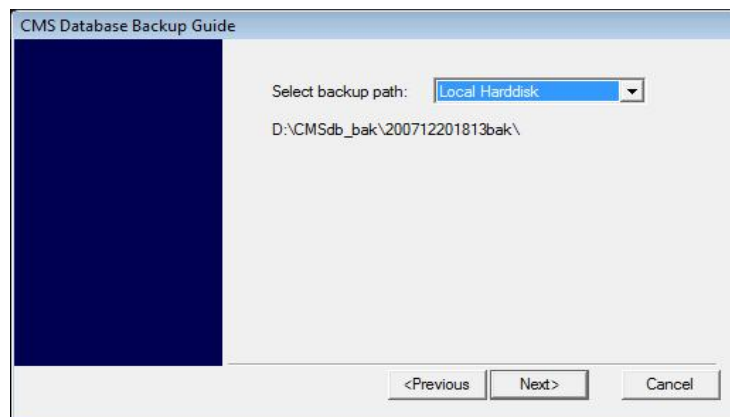
3.7.4 Initial Database Backup

After the CMS is installed, the database needs to be backed up.

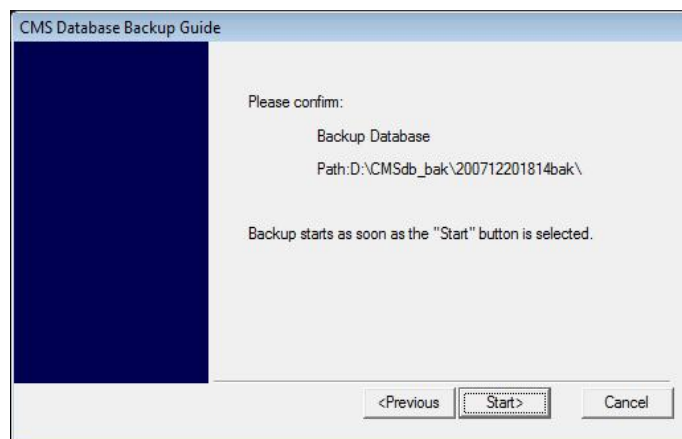
1. Run the CMS. Select “Others” from the “Admin Setup” window and then click “Database Backup and Recovery” to enter the following window.



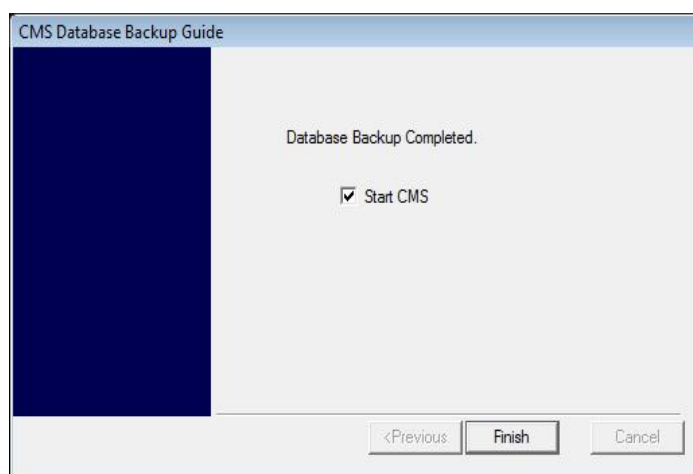
2. Select “Database Backup” to enter the following window:



3. Select “Local Hard disk” and then “Next” to enter the following window.



4. Click “Start” to start to backup the database until the following window appears:



5. Click “Finish” to start the CMS.

NOTE

- The above is initial database backup when the CMS is installed. The database at that time does not contain any data. During actual maintenance, it may be necessary to backup database which has saved a large amount of data. If they are backed up onto the hard disk, the old backup will be deleted and only the latest are backed up.
- When it comes to back up database onto the removable storage medium, make sure that the removable storage medium is not infected with virus. Perform virus scanning or formatting in advance.

FOR YOUR NOTES

4 Software Upgrades

NOTE

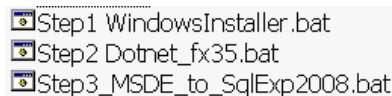
- It is recommended to backup the database before software upgrading. Please refer to *3.7.4 Initial Database Backup* for operation.
 - Exit the CMS before performing software upgrade. If the original monitored data does not need to be stored, you can reinstall the CMS software by following the instructions in Chapter Three and create a new database. If the original monitored data needs to be stored, you have to upgrade the database.
 - If the database is MSDE or SQL Server 2005 Express, it needs to be upgraded to SQL Server 2008 Express first.
 - If the database is SQL Server 2008 Express, perform the upgrade starting from *4.3 Step 3*.
 - If the database is MySQL, perform the upgrade starting from *4.4 Step 4*.
 - Do not shut down PC or powered off during software upgrading; otherwise, the upgrading may fail.
-

4.1 Step 1: Upgrading to SQL Server 2008 Express

Insert the CMS tool software CD (300B-30-47716).

4.1.1 From MSDE

Go to the directory “MS SQL Server / For_Upgrade_Only / MSDE_to_SQL2008_On_XP”. Install the below file one by one, after you have installed one of them please remember to restart the PC.



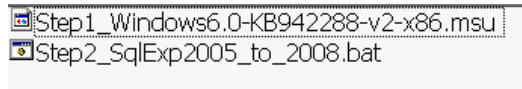
Please refer to the section *3.6 Installation of Database Software*.

NOTE

- Restart the computer manually after one of the setup files is installed.
-

4.1.2 From SQL Server 2005 Express

Go to the folder “MS SQL Server / For_Upgrade_Only / SQL2005_to_SQL2008_On_Vista”.
Install the below file one by one, after you have installed one of them please remember to restart the PC.

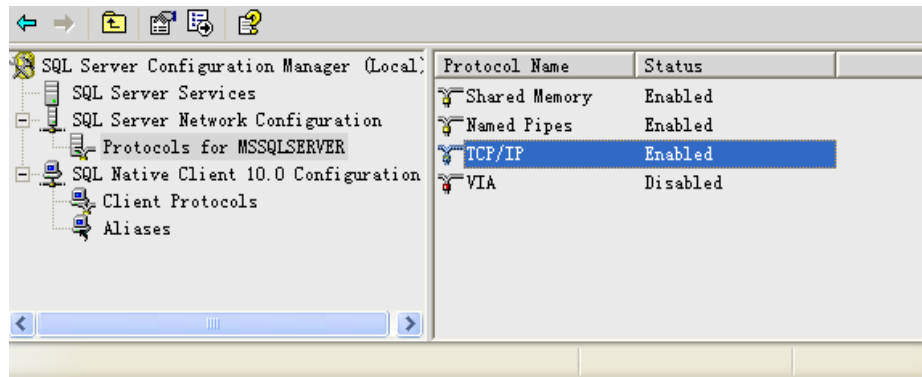


NOTE

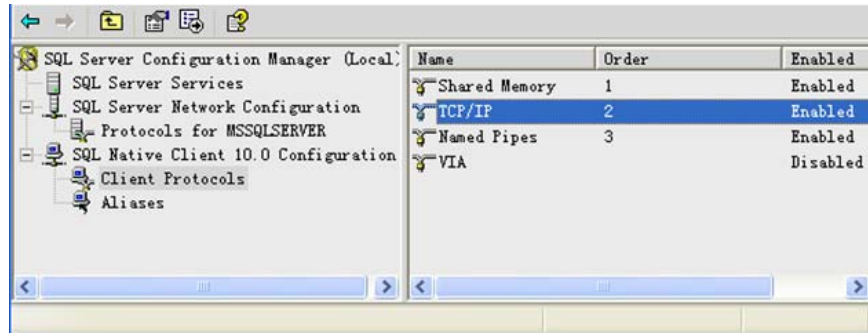
-
- Restart the computer manually after one of the setup files is installed.
-

4.2 Step 2: Configuring the Database

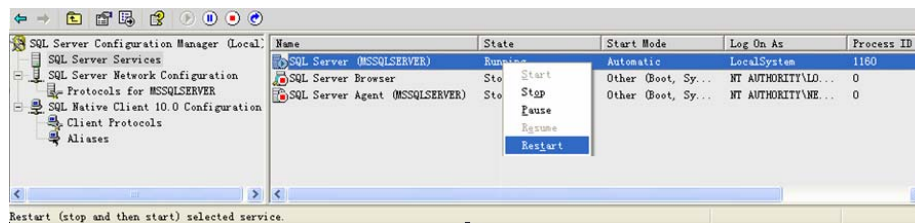
Access the "Start" Menu of your computer and select the “Programme”——»“Microsoft SQL Server 2008”——»“Configuration Tools”——»“SQL Server Configuration Manager”. Then the following screen pops up. Select “Protocols for MSSQLSERVER” from “SQL Server Network Configuration” and set “TCP/IP” on the right of the screen to Enabled.



Then select “Client Protocols” from “SQL Native Client 10.0 Configuration” and set “TCP/IP” on the right of the screen to Enabled.



Select “SQL Server Services” and select “SQL Server (MSSQLSERVER)” on the right of the screen. Right click the mouse and select "Restart" to restart the database service.



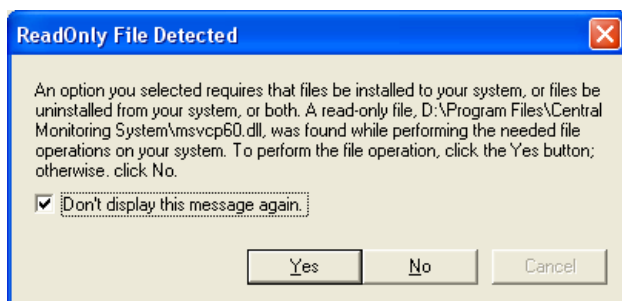
4.3 Step 3: Installing MySQL Database Software

Please refer to *3.6 Installation of Database Software* for the installation of MySQL database software.

4.4 Step 4: Upgrading the CMS Software

Enter the OS Control Panel and unload the “Central Monitoring System” from “Add/Remove Programs”.

If the following dialogue box appears during uninstallation, check “Don’t display this message again” and then select “Yes”.

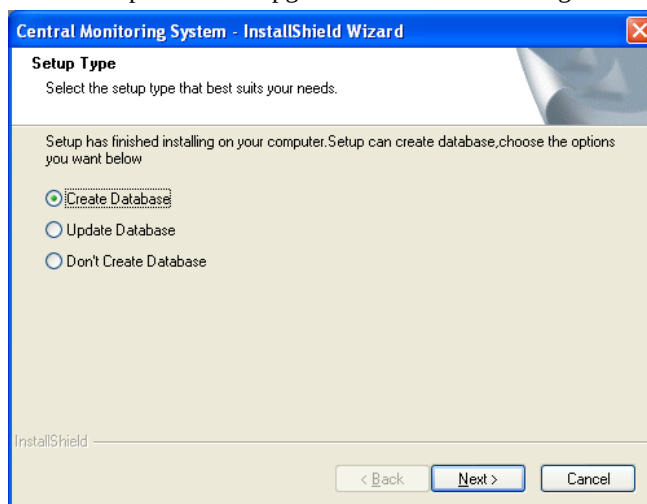


Restart the computer after the system software is completely uninstalled.

After restart, insert the CMS system software CD (300B-30-47617) and run the “setup.exe” file under the “Setup” directory. Refer to **3.7 Installation of the System Software**.

4.5 Step 5: Upgrading the Database

Select desired database options to be upgraded when related dialogue box pops up.



4.5.1 Create Database

Performing this operation could result in loss of data, as it will delete all data stored in the current database and then create a new one.

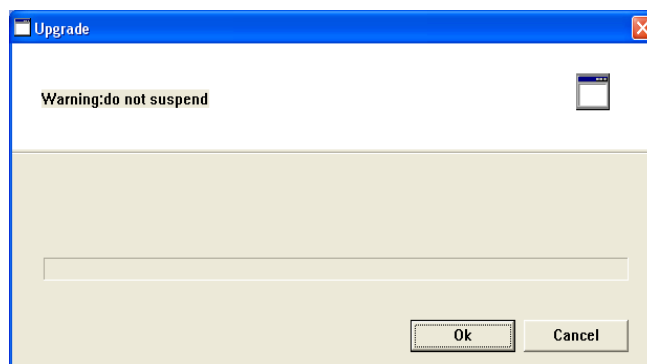
NOTE

-
- **When a new database is created, all the already stored data in the database will be deleted. Please take this operation with caution.**
-

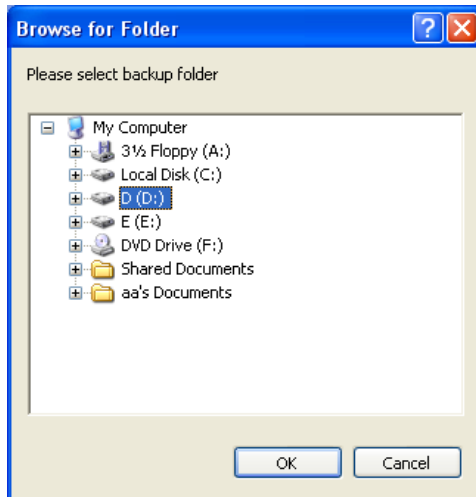
4.5.2 Update Database

This option is intended for the database upgraded from the old version to the latest version. The upgrade tool will automatically backup and restore the data in the current database.

Click [Next], then a dialog box pops up as below:



Click [OK], and then a dialog box pop up as below:



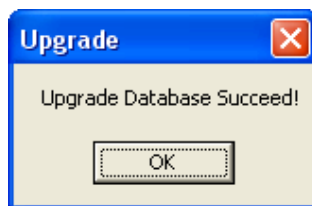
Choose the data backup directory, which is used to back up the original database and recover the original database in the case of upgrade failure.

NOTE

-
- **When you choose the path for backup, the system will list the storage partition with enough disk space. You can choose the partition as needed.**
-

Click [OK] and upgrade starts.

When a successful upgrade, the following dialog box pops up.



When upgrade fails, the upgrade tool recovers the original database automatically.

NOTE

- Once the database upgrading succeeds, please back up the database immediately, Refer to *3.7.4 Initial Database Backup* for detailed operations.
 - If the data size of saved patients in the database is very big, it will take a long time to upgrade the database, possibly for several hours. Please wait with patience. Therefore, software upgrading typically should be arranged in the idle period of the CMS. It is also necessary to communicate with client in advance for this situation.
-

4.5.3 Don't Create Database

Select "Don't Create Database" if CMS system software rather than database software is reinstalled and the current database file is compatible with the reinstalled system software.

4.6 Uninstall SQL Server 2008 Express

If SQL Server 2008 Express is installed during software upgrading, please access the Control Panel in operation system and unload SQL Server 2008 Express after the CMS software has been installed.

NOTE

- After upgrading the CMS software, if SQL Server 2008 Express is installed during the upgrade, you must unload SQL Server 2008 Express after the CMS software has finished upgrading. Otherwise, the normal running of the CMS will be affected.
 - After upgrading the CMS software, it is necessary to reset the binding relations of each bed, each patient's waveform storage and so on.
-

4.7 USB Watchdog Compatibility

The upgraded CMS software is compatible with the original watchdog. However, some newly added functions may not be disabled.

FOR YOUR NOTES

5 System Quick Recovery

5.1 Overview

Section “3 *System Installation*” is applicable to a new operating system. For the sake of quick maintenance, you can recover disk to recover the system.

Quick disk recovery can recover the system to either of the following states:

- Previously-backed up CMS or/and database
- Pure Windows

5.1.1 Quick Recovery Classification

Quick recovery can be from hard disk or CD.

- Recover from hard disk: refers to recovery from backup files which are saved in the hard disk. This method can be used when both the hard disk and backup files are in good condition. Because the backup files are in the hard disk, only one recovery disk is needed for this method.
- Recover from CD: refers to recovery from backup files which are saved in the CD. This method can be used when new hard disk is used and partitioned already. The requirement for partition is that disk C and D are in the NTFS format and disk E is in the FAT32 format. Saving the backup files may need multiple disks. Therefore, one set of complete recovery disks are needed for this method.

5.1.2 Application Scope

Before using, it is necessary to determine the cause of system failure. If the computer’s failure to restart is caused by damaged hard disk, you must replace the hard disk and then resort to the method of recovering from CD. If the hard disk is not partitioned, partition it using the recovery disk. For details, refer to **5.2.5 System Partition**

If the system failure is related to software (including the operating system and CMS software) and the partition of the hard disk still meets the factory requirements, quick recovery is applicable.

NOTE

-
- Do not do quick recovery if system failure is caused by other reason.
-

5.1.3 Precautions

All files used for quick recovery installation are saved under Disk E; therefore, any operation on the E partition by the user is forbidden:

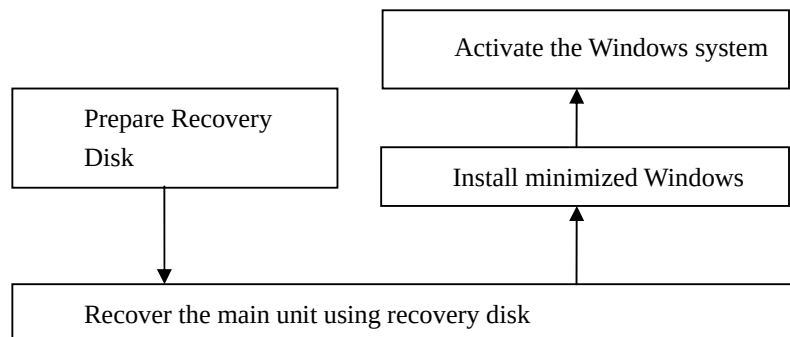
- Deleting a file
- Adding a file
- Modifying a file name
- Formatting
- Changing a driver symbol
- Format of partition. The E partition must be in the FAT32 format whereas the C and D partitions must be in the NTFS format.
- Changing the hard disk partition information, including driver symbol for each partition, format and size of partition.

In case of system recovery failure due to changed partition information, you must re-install the operating system and the CMS. If system recovery failure is caused by damaged files under the ghofiles folder in disk E, you can first delete the ghofiles folder (including the files under it) and then recover the system using recovery disk. If recovery fails, consider to recover pure operating system status. If recover still fails, you must re-install the operating system and CMS software.

NOTE

- Quick recovery will format the C and D partitions of the hard disk; therefore, backup your desired data in the C and D partitions before performing the recovery operation. We assume no responsibility for loss of data during the recovery.
-

5.1.4 Quick Recovery Procedure



5.2 Quick Recovery of Disk Usage

5.2.1 CD Drive Startup

Make sure that mainboard BIOS is first started from the CD drive.

5.2.2 Recovery from Hard Disk

System backup files are saved in the disk E. They are:

- E:\win.gho and win00001.ghs files or only E:\win.gho (pure Windows system backup)
- E:\ghofiles\sysbck.gho and sysbck.ghs files or only E:\sysbck.gho (the HYPERVISOR V central monitoring system backed up last time)

1. Step 1:

Insert the recovery startup CD to restart the computer. Wait for accessing the functional selection menu.

2. Step 2:

Access the functional selection menu, as shown below.

```

Recovery And Ghost Wizard.

Utility For Customer Service and
Manufacture.

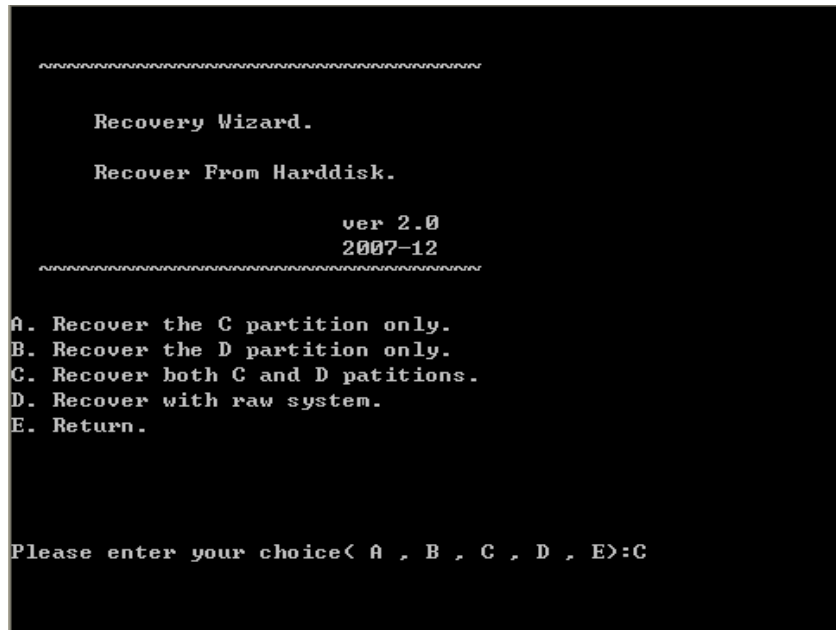
ver 2.0
2007-12

A. Harddisk Recover Page.
B. CD-ROM Recovery Page.
C. Partition Page.
D. Ghost to E Partition.
E. Restart Computer.

Please enter your choice< A , B , C , D , E >:A
```

- Select A to enter hard disk recovery menu. No confirmation is required.
- Select B to enter CD recovery menu. No confirmation is required.
- Select C to enter system partition wizard. No confirmation is required.
- Select D to back up the system. Confirmation is required.
- Select E to restart the computer. Confirmation is required.

Input A to enter hard disk recovery wizard, as shown below.



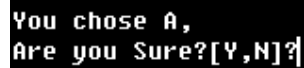
- Select A to recover the C partition only. The operating system and Hpervisor VI central monitoring system are recovered.
- Select B to recover the database files only.
- Select C to recover both C and D partitions. The operating system, Hpervisor VI central monitoring system and database files are recovered.
- Select D to recover the original operating system. Hpervisor VI central monitoring system and database files are not installed.
- Select E to return.

NOTE

- If C and D partitions are recovered simultaneously, the data in the CMS database will be lost and the system will recover the factory configuration. Before recovery, make sure that files in the database are disposed properly.
 - **If D partition is recovered, the data in the CMS database will be lost and the data will recover the factory configuration. Before recovery, make sure that files in the database are disposed properly.**
 - **In the case of recovering original operating system, only data in C partition are recovered.**
-

4. Step 4:

After a, b, c or d is input, a prompt message appears for your confirmation, as shown below.



```
You chose A,  
Are you Sure?[Y,N]?
```

Key in “y” (regardless of case) for confirmation and “n” for returning to the previous step.

5. Step 5:

During the recovery, no human intervention is required. After the recovery, the system returns to step 2. You can select E to restart the computer to complete recovery. Then remove the quick recovery disk from the CD drive.

After recovery, restart the computer to enter minimized installation by referring to **5.3**

Mini-Setup after Recovery

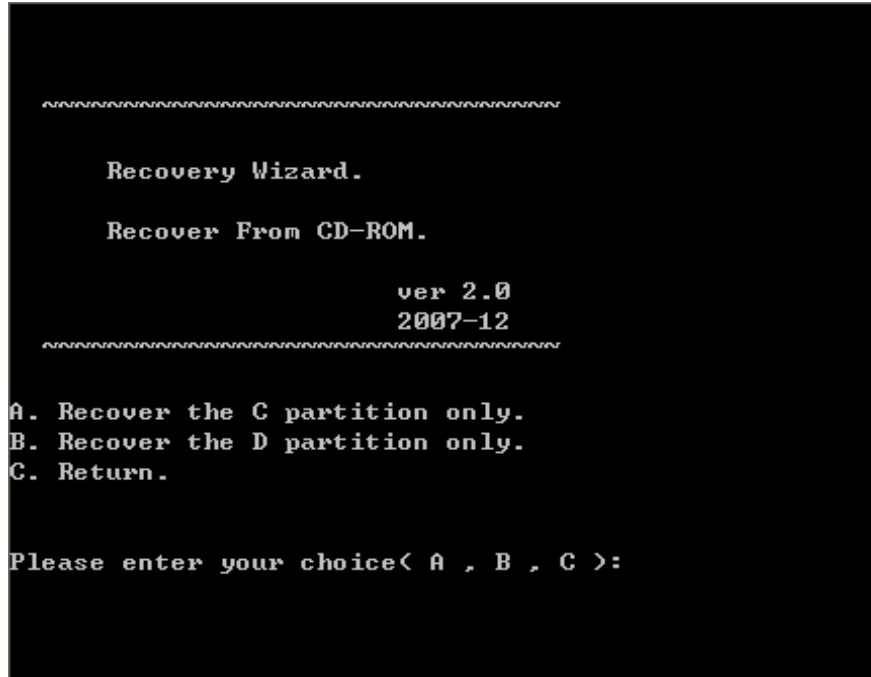
5.2.3 Recovery from CD-ROM

NOTE

- Make sure that the backup files in the CD are correct in terms of computer type, single/double screen and Windows operating system version.
-

1. Step 1:

Starting from step 2 in 5.2.2, select B to enter CD recovery wizard, as shown below.

A screenshot of a black terminal window with white text. The text is as follows:

```

~~~~~

Recovery Wizard.

Recover From CD-ROM.

                                ver 2.0
                                2007-12
~~~~~

A. Recover the C partition only.
B. Recover the D partition only.
C. Return.

Please enter your choice< A , B , C >:
```

Key in a, b or c (regardless of case).

- Select A to recover the C partition only. The operating system and Hpervisor VI central monitoring system are recovered.
- Select B to recover database files only.
- Select C to return.

NOTE

-
- If C partition is recovered, only data in the C partition are recovered.
 - **If D partition is recovered, the data in the CMS database will be lost and the data will recover the factory configuration. Before recovery, make sure that files in the database are disposed properly.**
-

2. Step 2:

Key in a or b. A prompt message appears for your confirmation, as shown below.

A screenshot of a black command prompt window with white text. The text reads: "You chose A," followed by "Are you Sure?[Y,N]?" on the next line.

Key in “y” (regardless of case) for confirmation and “n” for returning to the previous step.

3. Step 3:

During the recovery, no human intervention is required. After the recovery, the system returns to step 1. You can select C to return to **5.2.2Recovery from Hard Disk** and E to restart the computer to complete recovery. Then remove the quick recovery disk from the CD drive.

After recovery, restart the computer to enter minimized installation by referring to 5.3 Mini-Setup after Recovery

NOTE

- In the case of recovering C partition followed by D partition, you must restart the computer and recover as per the above steps and vice versa.
-

5.2.4 System Backup

NOTE

- System backup will back up the data in both C and D partitions simultaneously and overwrite the previous system backup.
-

Starting from step 2 in 5.2.2. select D. A prompt message appears for your confirmation, as shown below.

A screenshot of a black command prompt window with white text. The text reads: "You chose D," followed by "Are you Sure?[Y,N]?" on the next line.

During the backup, no human intervention is required. After the backup, the system returns to step 2 in 5.2.2.

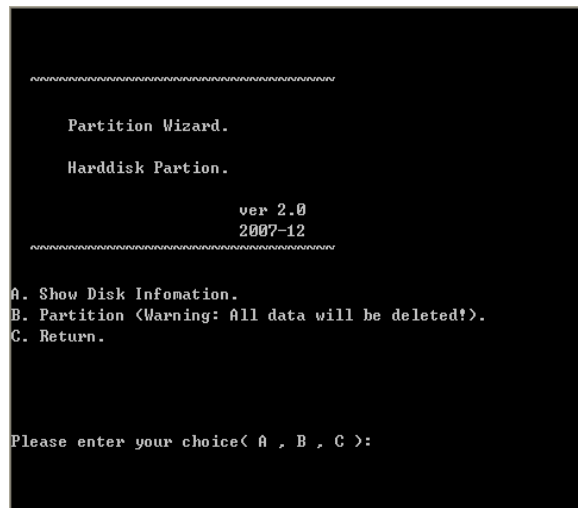
5.2.5 System Partition

NOTE

- System partitioning will format the whole hard disk and delete all data. Take care when performing system partitioning. Make sure that all useful data are already backed up.
-

1. Step 1:

Starting from step 2 in 5.2.2., select C to enter partition wizard, as shown below.

A screenshot of a text-based menu titled "Partition Wizard." and "Harddisk Partion." (note the typo). It shows version "ver 2.0" and date "2007-12". The menu options are: "A. Show Disk Infomation." (note the typo), "B. Partition <Warning: All data will be deleted!>.", and "C. Return.". At the bottom, it prompts "Please enter your choice< A , B , C >:". The background is black and the text is white.

```

Partition Wizard.

Harddisk Partion.

ver 2.0
2007-12

A. Show Disk Infomation.
B. Partition <Warning: All data will be deleted!>.
C. Return.

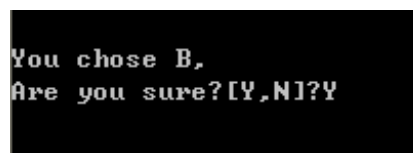
Please enter your choice< A , B , C >:
```

Key in a, b or c (regardless of case).

- Select A to show the current disk partition.
- Select B to re-partition the whole hard disk.
- Select C to return.

2. Step 2:

Key in B. A prompt message appears for your confirmation, as shown below.

A screenshot of a confirmation prompt. The text reads: "You chose B," followed by "Are you sure?[Y,N]?Y". The background is black and the text is white.

```

You chose B,
Are you sure?[Y,N]?Y
```

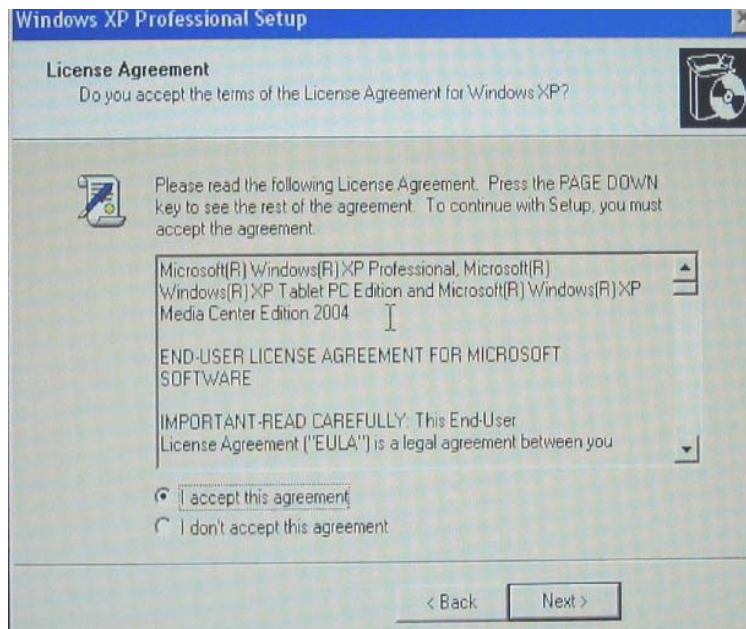
Key in “y” (regardless of case) for confirmation and “n” for returning to the previous step.

5.3 Mini-Setup after Recovery

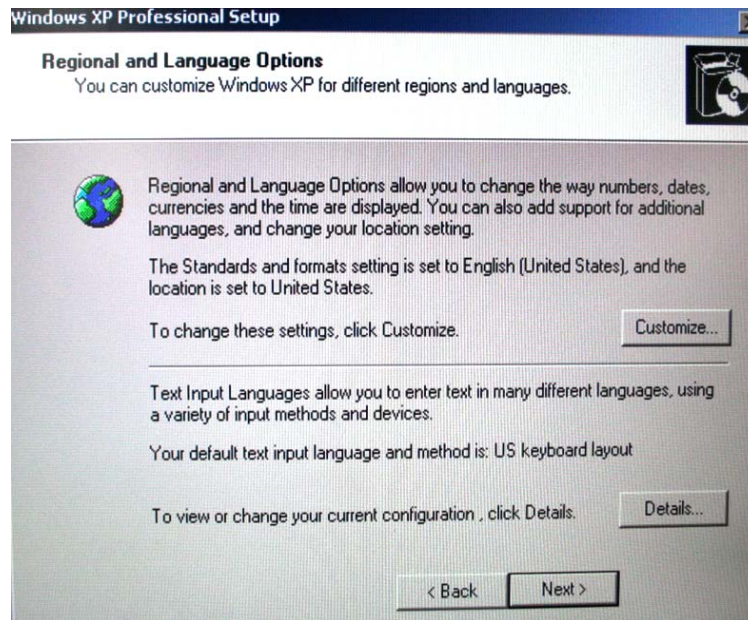
1. After system recovery, restart the computer to enter the following window.



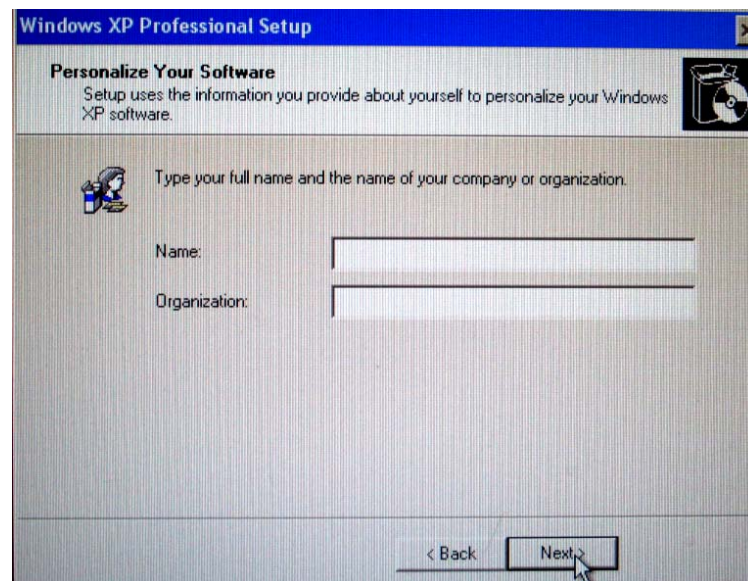
2. Click "Next" to enter the following window.



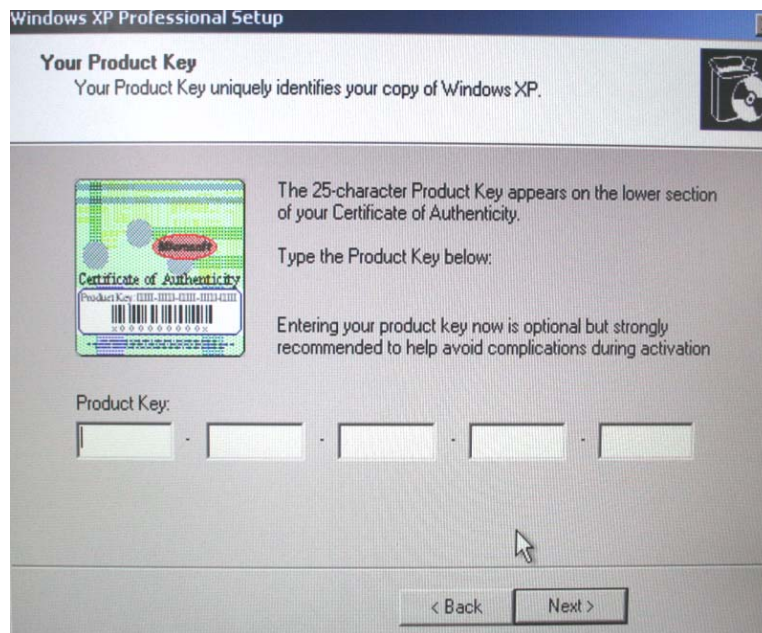
3. After setting as the figure shows, click “Next” to enter the following window.



4. Click “Next” to enter the following window.



5. Input name and unit. Then click “Next” to enter the following window.



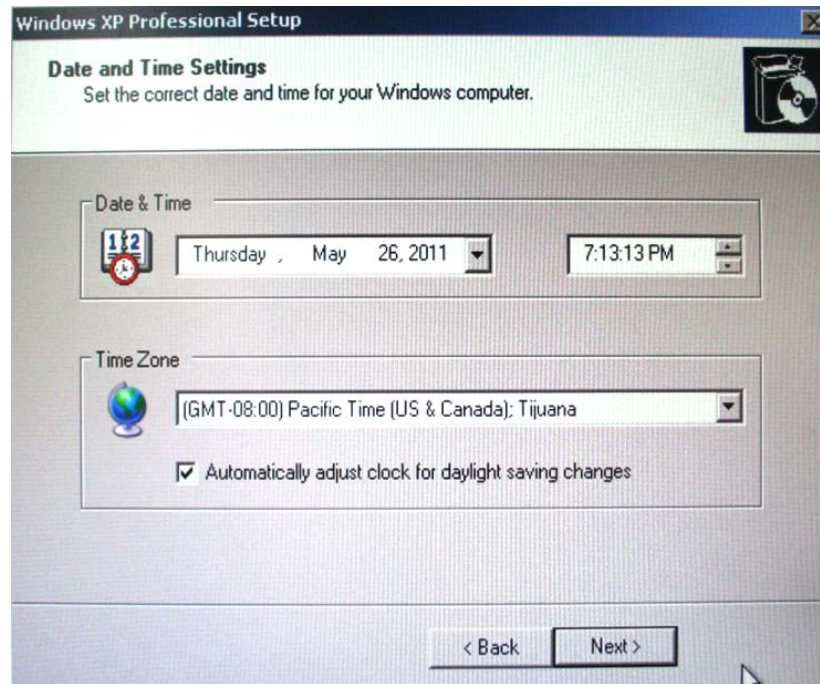
6. Acquire key from Windows License label on the cabinet and input the key. After that, click “Next” to enter the following window.

NOTE

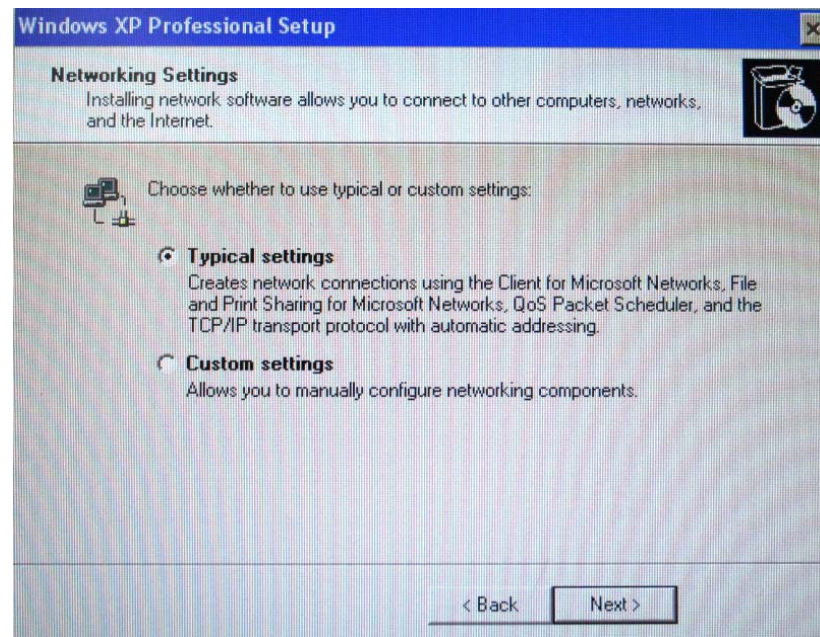
-
- **Do not enter system administrator password.**
-



- Click “Next” to enter the following window.



- Click “Next” to enter the following window.



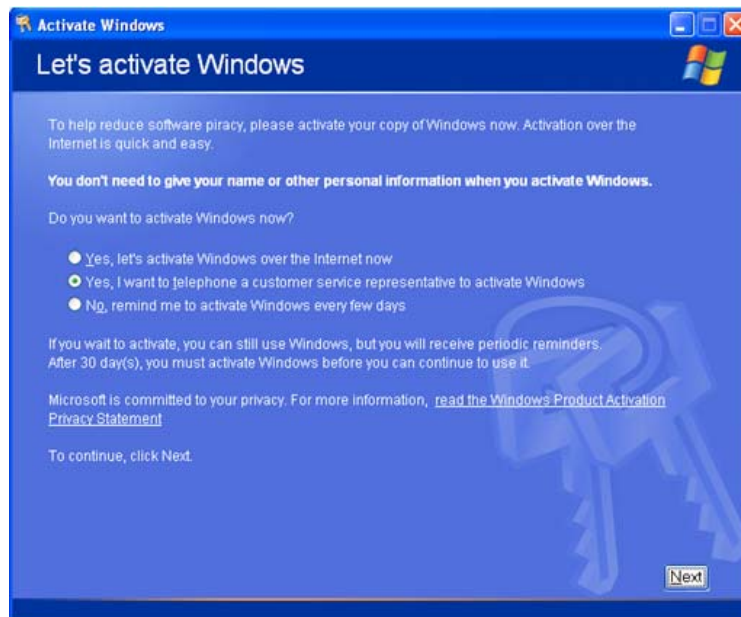
- Click “Next” until the finish window appears. Click “Finish”. The system restarts automatically. After restart, the log-in box appears.
- Enter password according to the following Note to log in onto the system.

NOTE

- After the system containing CMS is recovered, the log-in password for minimized installation is “320666”. Then the CMS runs automatically.
 - **If pure Windows operating system is recovered, the system is logged automatically after minimized installation. No password is required.**
-

5.4 Windows System Activation

1. Click “Start” and then “Run” in the Windows taskbar. Key in “oobe/msoobe /a” to enter the following window.



2. Select as the figure shows. Then click “Next” to enter the following window.



Select as per the steps shown in the figure. Dial the service phone based on the telephone number in step 2 and installation ID in step 3. Acquire and enter confirmation ID. Then click “Next” to activate the system.

NOTE

- If the previously backed up CMS is recovered, you need to back up the database of the CMS. For details, refer to 3.7.4 Initial Database Backup.
 - After the pure Windows operating system is recovered, refer to 3 System Installation to install the CMS.
-

6 Maintenance and Cleaning

6.1 Maintenance

Failure on the part of the responsible hospital or institution employing the use of the central monitoring system to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazard.

WARNING

- The safety checks or servicing involving any disassembly or decomposition of devices should be performed by professional servicing personnel; otherwise, it may lead to undue equipment failure and possible health hazards.
 - **Turn off the CMS if no patients are to be monitored. If the system has been running for half a year continuously, restart the system.**
-

6.1.1 General Inspection

Whenever your system is repaired, upgraded or has been used for 6-12 months, a thorough inspection should be performed by qualified service personnel to ensure the reliability. Before the central monitoring system is put into use and when it is in use, follow these guidelines to inspect it:

- Inspect the equipment and its accessories for mechanical damage;
- Inspect if the environment and power supply meet the specified requirements;
- Inspect all power cords and signal lines for fraying or other damages, and if they are properly connected and insulated;
- Inspect if the sound system functions normally;
- Inspect if each function of the system is in good condition;
- In case of any damage or abnormality, do not use the central monitoring system. Contact the hospital biomedical engineers or our service personnel immediately.

6.1.2 System Performance Test

After the central monitoring system is reinstalled or quick recovery installation is performed, follow this procedure to make sure that the system functions correctly:

- Display setup
- Functional test of admitting patient
- Record and print
- Functional test of Watchdog
- Clear database
- Shut down

6.2 Cleaning

Your equipment should be cleaned on a regular basis. If there is heavy pollution in your place or your place is very dusty and sandy, the equipment should be cleaned more frequently. The equipment to be cleaned includes the main unit (including power fan, cabinet fan or other fan etc.), displays, printer, recorder, keyboard and mouse. Before cleaning the equipment, consult your hospital's regulations for cleaning, disinfecting and sterilizing equipment

WARNING

- **Be sure to shut down the system and disconnect all power cords from the outlet before cleaning the equipment.**
- **Cooling fans installed on CPU, display adapter and cabinet should be cleaned on a regular 6-months time interval. If any malfunction of cooling fan is encountered, please contact supplier for replacement as soon as possible. Dust accumulation on cooling fans can lead to fan damage and failure, so that key component may be burned due to high temperature.**

The exterior surfaces of the equipment may be cleaned with a clean and soft cloth, sponge or cotton ball, dampened with a non-erosive cleaning solution. Drying off excess cleaning solution before cleaning the equipment is recommended. Following are examples of cleaning solutions:

- Diluted soap water
- Diluted ammonia water
- Hydrogen peroxide (3%)
- Isopropyl alcohol
- Workstation/server cleaning solutions
- Liquid crystal display (LCD) detergent

Follow these rules to clean the equipment; otherwise, it may melt, distort, or dull the finish of the case, blur lettering on the labels, or cause equipment failures.

- ALWAYS dilute the solutions according to the manufacturer's suggestions.
- ALWAYS wipe off all the cleaning solution with a dry cloth after cleaning.
- NEVER SUBMERGE the equipment into water or any cleaning solution, or POUR or SPRAY water or any cleaning solution on the equipment.
- NEVER permit fluids to run into the casing, switches, connectors, or any ventilation openings in the equipment.
- NEVER use abrasive materials and erosive or acetone –based cleaners.

 WARNING

- Disinfection or sterilization may cause damage to the equipment; therefore, when preparing to disinfect or sterilize the equipment, consult your hospital's infection controllers or professionals.
 - **The cleaning solutions above can only be used for general cleaning. If you use them to control infections, we shall assume no responsibility for the effectiveness.**
-
-

FOR YOUR NOTES

7 Troubleshooting

7.1 The displayed language of CMS screen has clobber.

Please ensure the region and language of the operating system is the same with the language set in the CMS system.

1. to set up the region and language of the operating system

Please refer to Section 3.7.1.

2. to set up the language of the CMS

Click “System Setup” → “Admin Setup” → “Other” → “Language” and select the desired language.

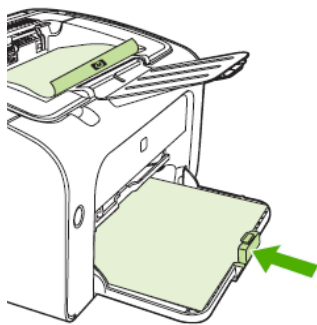
7.2 Recorder/printer-related technical alarm messages

Please refer to the “HYPERVISOR VI Central Monitoring System Operator’s Manual” section 11.

When print fails, please follow the instruction to recover the print job:

1. Restart the printer.
2. By clicking “System Setup” button and then select “Printing Control” sheet.
3. Click the button “Restart Print Service” to resume.
4. Select the printer in “Printing Control” sheet.

Also, after the paper is loaded in the main input tray, push the tab close to the end of paper.



7.3 Network printing fails

Follow the steps below.

1. Click “System Setup” button and then select “Printing Control” sheet. Restart the print job. Try other printers in the printer list. If the problem still exists, turn to the next step.
2. Check whether network printing works in Windows system. If it works, restart the computer, enter the CMS and repeat step 1. If the problem still exists, turn to the next step.
3. Verify the network cable between printer and CMS host is normal.
4. Verify the printer’s IP address and CMS host’s IP address are in the same network segment. Please refer to printer’s accompanying documents or ask the vendor’s customer service for the method of getting printer’s IP address. For example, for HP LaserJet 1505n, press the print button on the panel to print the configuration report which has IP address information. For HP LaserJet 2035n, press the print button on the panel for 5-10s to print the configuration report.
5. If the verification is Ok but the problem still exists, try to delete the printer driver and reinstall it by referring to **3.5.5 Installation of Printer**.
6. If the problem still exists after driver installation, please contact the vendor’s customer service.

7.4 No waveform displayed in waveform review

This symptom indicates that the user does not add the waveforms that need to be saved. To remove this fault, click in the patient window and then select “Display Setup” to enter the “Display Setup” tab sheet, select “Wave Save” and then add your desired waveforms.

7.5 Multi-/Dual-screen changes to Single-screen during the CMS installation

1. Check if the displays are connected to host and work functionally.
2. Check if the display mode is set correctly; please refer to **3.5.1 Double Screen Display Adapter**, **3.5.2 Implement Double Screen Display by DP-to-VGA Adapter** or **3.5.3 Installation of Multi-Screen Extend Device (HP T100)**..

7.6 Remove watchdog error

The following prompt message may appear during installation or running.

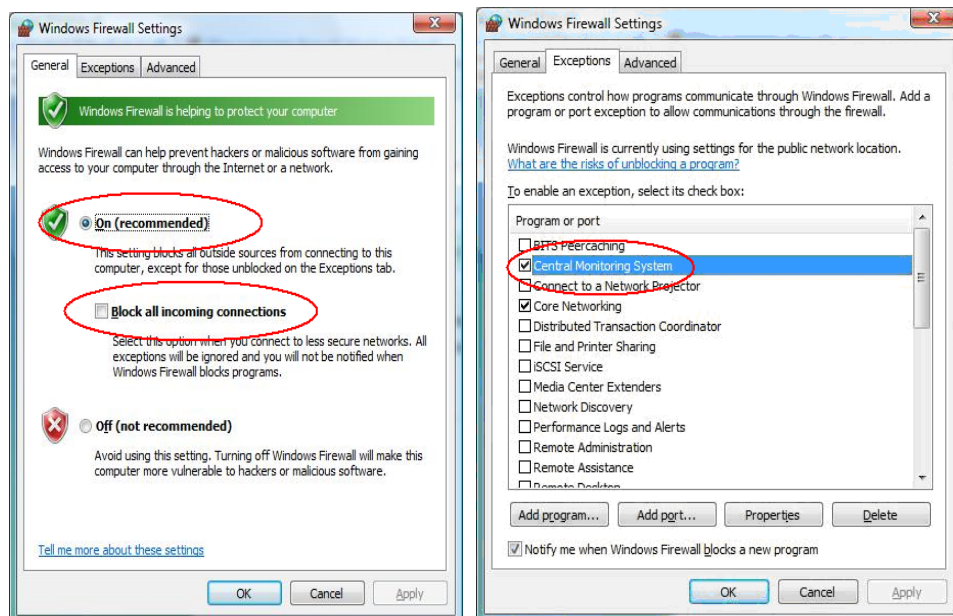


Watchdog error may be caused by watchdog drive not installed, watchdog inserted improperly, or USB port damaged. Please check watchdog driver or reinsert watchdog.

7.7 CMS unable to connect the bedside monitor

This fault may be caused by network configuration, network cable plugged improperly, network cable damaged etc. Refer to the following procedures to troubleshoot this fault.

1. Check if the network cable is plugged properly.
2. Check network configuration to see if the IP address of the CMS and that of network bed number of the monitor are configured correctly.
3. Check if the firewall configuration is correct as the following picture. If not, continue with the following procedures.



Use ping command to check if the CMS can be connected to the bedside monitor. Try to ping as much monitors as possible. In the case of ping failure, the fault may lie in hardware. Check if the crystal connector on the network cable or the network cable is damaged by using special tools.

7.8 Abnormal Database Service Handling

If database service stops by accident or runs abnormally, it will make the CMS unable to normally save patient data. When this situation occurs, please try to restart the CMS. If the high level system alarm disappears, it indicates that database service restores to normal storage status. If the high level system alarm still persists, it indicates that database is severely damaged. In this case, you need to re-install database software. Please refer to **3.6 Installation of Database Software** for detailed operation.

7.9 Database Backup and Recovery in Case of System Failure

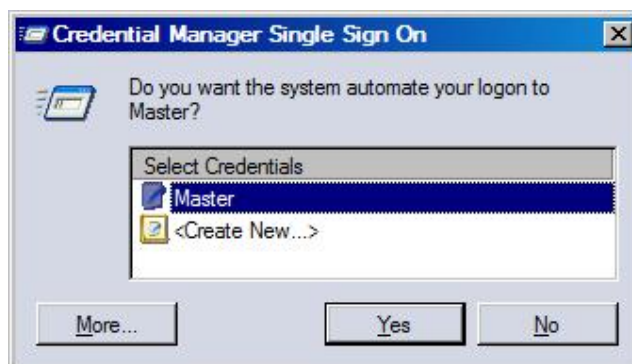
You can use the database backup and recovery tool to backup the current database and restore the database.

For example, you can backup the current database before you change the hard disk, reinstall the operating system or recover the CMS using the “quick recovery disk”; and then restore the data using the backup database after the operating system has been installed or the CMS has been recovered.

For database backup and recovery, refer to the operating manual.

7.10 “Credential Manager Single Sign On” Dialog Box

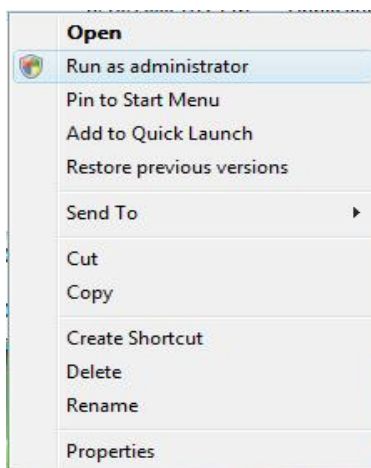
If HP Protect Tools Manager is installed, dialog box “Credential Manager Single Sign On” as shown below may pop up when you enter the password on the CMS, e.g. when you enter the password to access the Admin Setup or Factory Setup menu. In this case, select “NO”.



7.11 Troubleshooting under the Vista system

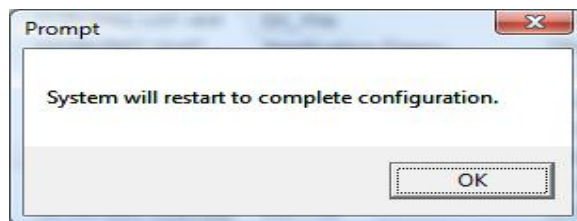
7.11.1 CMS cannot be installed normally

This problem is often caused by Vista security policy. To troubleshoot this problem, right click “Setup.exe” under the Setup directory and select “Run As Administrator”, as shown below.



7.11.2 Restarting the Computer is prompted during installation

The following prompt message appears when the CMS is installed under the Windows Vista system for the first time.



Click “OK” directly. Installation continues automatically when the computer is restarted.

7.11.3 Sound is out of control

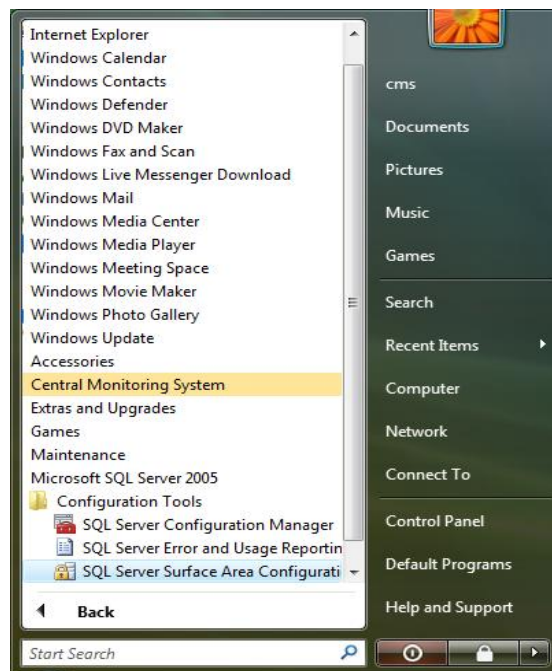
This problem is often caused by sound setting. Check sound setting to see if speaker sound volume is set to maximum. If not, set speaker sound volume to maximum and see if sound can be controlled.

7.11.4 Database cannot be connected normally

This problem is often caused by Vista security or Sql Sever is not configured with remote connection. To troubleshoot this problem:

1. Check if database service is configured with remote connection.

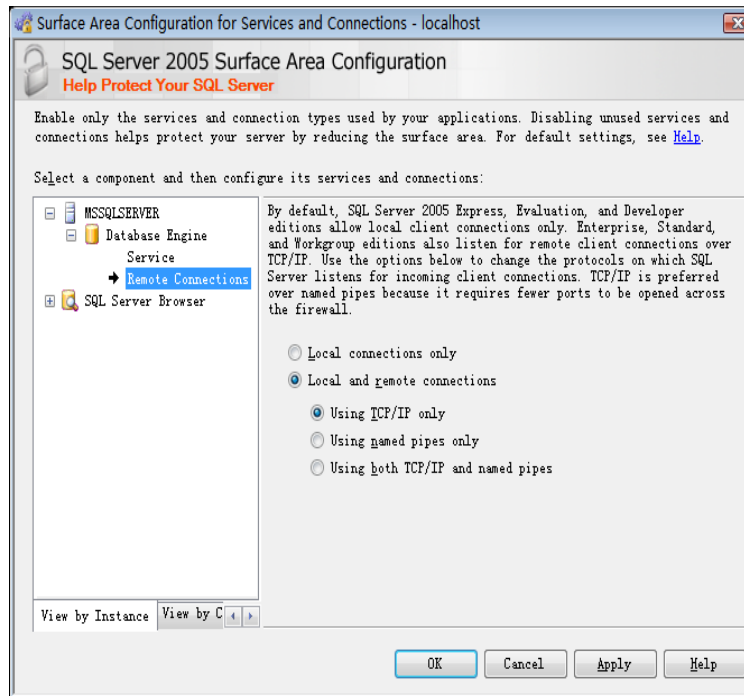
Step 1: Open QL Server Surface Area Configuration, as shown below.



Step 2: Open Surface Area Configuration for Services and Connections, as shown below.

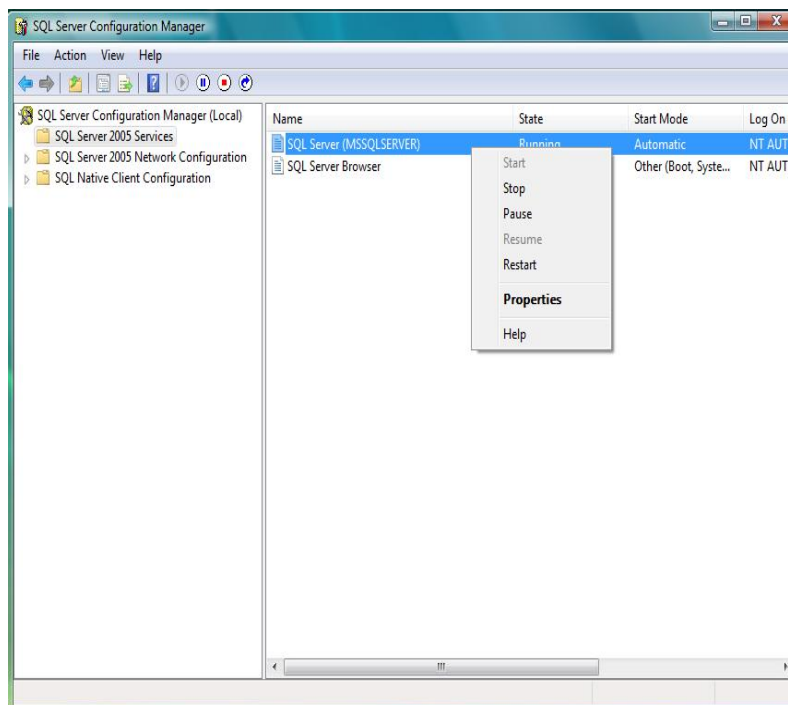


Step 3: Open remote connection, as shown below.



Step 4: Restart service

Select SQL Server Configuration Manager from Step 1 to enter the following window.
Operate as the figure shows.



2. Check if UAC is closed.

Select “Control Panel” → “User Account” → “Open or Close UAC”.

Remove the tick in the box “Use UAC to help protect your computer”.

Click “OK” and select to restart the computer based on the prompt message to activate the modification.

Mindray DS USA, Inc.
800 MacArthur Blvd.
Mahwah, New Jersey 07430
USA
Tel 1.800.288.2121
Tel 1.201.995.8000
www.mindray.com